INTERIOR LIGHTS, INSTRUMENTS, INSTRUMENT PANEL CONTROLS AND SENDER UNITS

33

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GENERAL DESCRIPTION

Facia Panel and Instrument Cluster

The Transit Facia panel contains the instrument cluster, driver operated controls and switches, and the heating and ventilation controls.

The instrument cluster is based on the award winning 'R' module first fitted to the Taunus/Cortina range. Three basic types of clusters are available.

Fig. 1A. This cluster is available on custom cab variants and available as an option on Base variants. It comprises of two large circular instruments, the large instruments being a speedometer, and a combined fuel level and engine coolant temperature indicator. A clock is fitted and located above the warning lights and between the two large instruments. The fascia is trimmed in a simulated wood effect.

A further cluster is available on Base variants and has two large circular instruments. These are a speedometer and a combined fuel level and engine coolant temperature indicator.

Fig. 1B. This facia is for vehicles fitted with a tachograph. Where the tachograph is fitted the fuel level and coolant temperature indicators are individually housed within the facia panel adjacent to the tachograph.

All instruments clusters have two rows of warning lights giving visual warning of direction indicators, low brake fluid level, headlamp main beam, and ignition. On Diesel variants 'pre-heat' and low vacuum warning lights are included in the warning light panels.

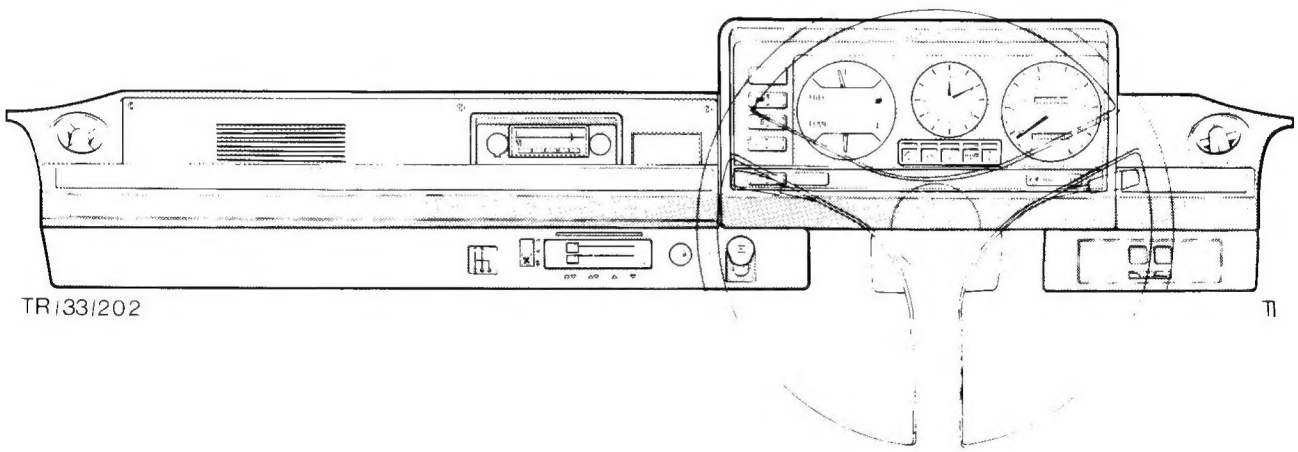


Fig. 1A. Petrol engined Custom variants with optional radio fitted

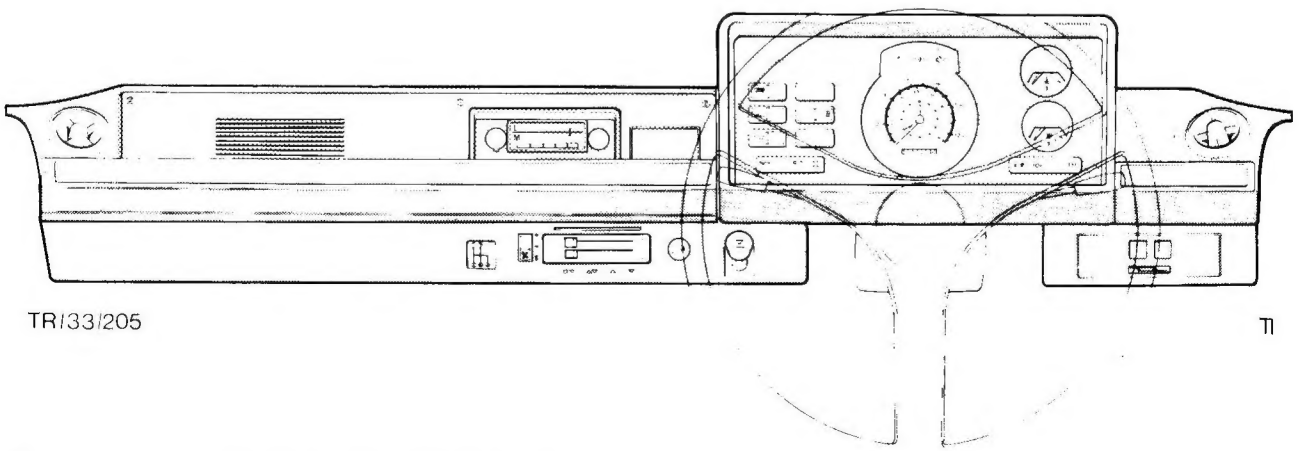


Fig. 1B. Diesel engined variants with optional radio fitted

GENERAL DESCRIPTION (cont'd)

Facia Mounted Controls

The heater controls are sited in the lower facia panel and are of the sliding type. The control positions are illuminated when the parking/driving lights are switched on.

Rocker type switches are provided for rear fog lamp (where fitted), front fog or driving lamps, (where fitted) hazard warning, and interior lamp.

Where a cigarette lighter is fitted, it will be located adjacent to the heater controls.

Steering Column Mounted Controls

Three multi-function switches are mounted on the steering column.

The left-hand switch controls the direction indicators, horn operation and headlamp dip/main beam and headlamp 'flash' controls.

The right-hand switch closest to the driver controls the two-speed windscreen wipers, windscreen and headlamp washers, (where fitted) and 'ON' – 'OFF' switch for the wiper delay circuit. The other right-hand switch controls the operation of the side lamps and headlamps.

Relays

Many of the wiring circuits require the use of relays within their circuitary. These relays are sighted in two basic locations.

The automatic transmission inhibitor relay, and glo-plug relay (where fitted), are attached to the battery tray, within the engine compartment.

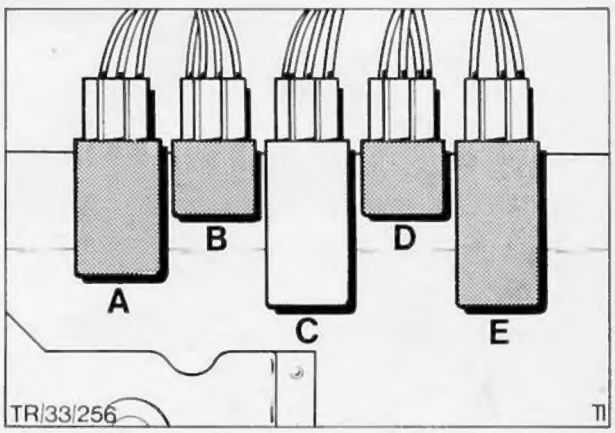
Other relays are located under the facia panel adjacent to the hood release, and clip onto the side cowl panel. Up to five relays are located as shown in Fig. 2 below.

Tachographs

To comply with legislation, certain territories require tachographs to be fitted to certain classes of vehicles within the Transit range. The variants effected are the Bus, Crewbus and Kombi models with a seating capacity (including the driver) greater than nine.

The tachograph is a 'black box' item with in-built seals to prevent unauthorised tampering. In the event of a defect occuring it should be returned to an authorised Ford dealer, or an approved repairing agent. Attempts to effect a repair by unauthorised agents, and the resultant damage to seals could result in infringements of legislation appertaining to tachographs and their operation.

Fig. 2. Relay positions and functions
- A – Intermitant windscreen wiper relay
- B – Headlamp wash relay
- C – Headlamp wash circuit control relay
- D – Heated rear screen relay
- E – Direction indicator/hazard flasher relay



PRINCIPLE OF OPERATION

Two types of tachograph will be encountered, they are:

1. 24 hours, single driver, which contains one record chart.
2. 24 hours, dual driver, which contains two record charts, one for each driver.

Territories which have tachograph legislation, require that the tachograph system is sealed, which limits the repair operations that an owner/Operator or Dealer can do, to relatively minor items. All major repairs to a tachograph should be carried out by an authorised agent.

DRIVER RECORD CHARTS

The following information, regarding driver record charts, should be considered by Dealers and Owner/Operators.

1. When a tachograph is fitted as original equipment, it is fitted with the appropriate paper charts, ready for operational use. Due to the current situation regarding tachograph legislation, i.e. certain territories have legislation, others do not, it is possible that some Owner/Operators will leave the original chart in place. Where a chart is left in place for too long, the stylii will eventually wear through the chart, and damage to the stylii and tachograph will result. This can also happen when vehicles are stored with the battery connected.

   For this reason it is important that Owner/Operators are made aware of this situation, and make regular chart changes.

   In instances where the normal paper chart will not be used, the Owner/Operator should be made aware that a plastic or 'blind', chart is available. The 'blind' charts have a much longer life than the normal paper charts, and should only be used in territories where tachograph legislation is not fully implemented.

2. It is essential that record charts are always fitted into a tachograph during its operation. On certain types of tachograph, a 'fault' light will registar on the face of the instrument if the card(s) are not inserted.

   Other types of tachographs do not have a warning light but serious damage to the stylii can result if a chart is not in place. It is therefore, important that a physical check is made using the chart illumination light and the chart viewing window, or by actually opening the front of the instrument itself.

PRINCIPLE OF OPERATION (cont'd)

INSERTION OF RECORD CHARTS

24 Hours, Single Driver

1. Check that the time shown on the tachograph clock is correct.
2. Open the front of the tachograph (this should only be done with the vehicle stationary). If the tachograph clock shows an incorrect time, it should be adjusted by rotating the clock setting wheel, shown in Fig. 3.

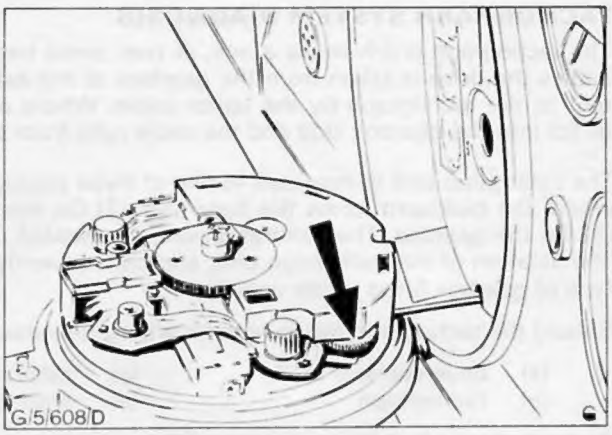


Fig. 3. Clock setting wheel (arrowed)

3. Lift the chart clamping lever, (where applicable), and place the chart over the centre boss.
4. On tachographs that use chart clamps, press the clamping lever down to retain the chart.
5. Close the tachograph.

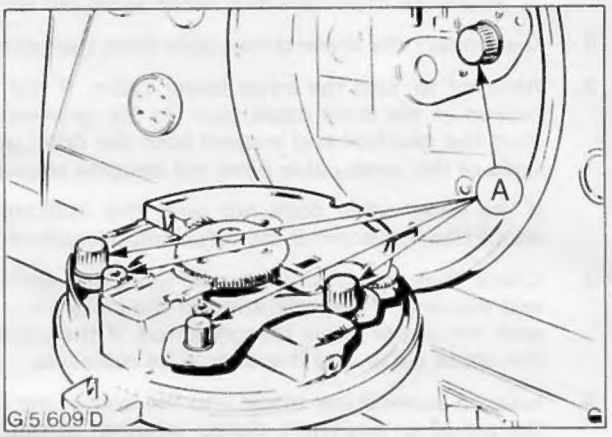


Fig. 4. Insertion of record chart (single driver)
A – Bulb locations

24 Hours, Dual Driver

1. Check that the time shown on the tachograph clock is correct.
2. Open the front of the tachograph (this should only be done with the vehicle stationary). If the tachograph clock shows an incorrect time, it should be adjusted by rotating the knurled wheel, 'E' in Fig. 5 in either direction.
3. Lift up the chart table, 'C' in Fig. 5.
4. Insert the chart for the non-driving crew member.
5. Press down the chart table until it snaps into position.
6. Place the driver's chart on the chart table.

NOTE: 1. Both charts must be inserted with the green side uppermost.

2. Two charts must always be in the tachograph, even when there is only one crew member.

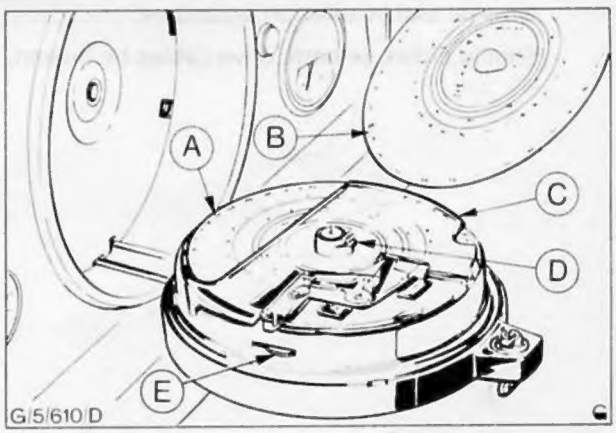


Fig. 5. Insertion of record chart (dual driver)
A – Non-driver's chart
B – Driver's chart
C – Chart table
D – Chart retaining clips
E – Clock setting wheel

PRINCIPLE OF OPERATION (cont'd)

TACHOGRAPH SYSTEM DIAGNOSIS

The tachograph is driven via a one, or two, piece heavy duty cable from the gearbox. In the case of two piece cables the drive is taken from the gearbox to the calibration unit by the lower cable and from the calibration unit to the tachograph by the upper cable. Where a one piece cable is used the calibration unit is screwed direct into the gearbox side and the cable runs from the calibration unit direct to the tachograph.

The calibration unit is mounted in one of three positions; (1) On the right-hand side of the bulkhead at a point where the bulkhead forms the floor pan. (2) On the right-hand chassis member in the engine compartment. (3) On the gearbox. The calibration unit is a sealed unit and should only be repaired by an authorised agent. The location of the calibration unit, and consequently the use of one or two piece cables, is dependent on the type of gearbox fitted to the vehicle.

Should the tachograph fail to register when the vehicle is driven, a fault is indicated in either;

(a) drive cable(s)
(b) tachograph
(c) calibration unit
(d) drive cable gear (in gearbox)

A check should first be made to establish whether or not the drive cable(s) are damaged.

NOTE: 1. The following procedure is for a 'two-cable' system. The same principles can be applied when diagnosing faults on a single cable variant.

2. Vehicles operating in territories where full tachograph legislation is in force will have seals applied at the cable ends. The following procedure necessitates disturbing these seals (if fitted). It is therefore important that these seals are renewed before the vehicle is returned to service.

1. Disconnect the lower drive cable from the calibration unit.

2. Attempt to turn the inner lower cable. If the inner cable turns, this indicates that either the cable is broken or the drive cable gear (in the gearbox) is damaged. In this instance, disconnect the drive cable from the gearbox and inspect both the drive gear and the cable. Ensure that either or both the square ends of the inner cable have not become rounded.

   If the inner cable does not turn, this indicates that the cable is probably satisfactory, but this cable should be inspected if the following procedures do not identify the malfunction.

3. Check that the calibration unit functions smoothly, by inserting a screwdriver blade, in the forked end and rotating. If the operation of the calibration unit is stiff, or if tight spots are evident repeat this check with the upper cable disconnected. If the calibration unit now operates smoothly a fault is indicated in the upper cable and this should be replaced.

4. Insert a screwdriver blade into the end of the inner upper cable. Spin the cable anti-clockwise and with the aid of an assistant, detect whether or not the tachograph registers. If there is no movement either the upper drive cable is broken, or the tachograph unit is faulty.

   Disconnect the drive cable from the rear of tachograph, and inspect both ends of the cable. If broken or damaged, replace.

   If the drive cable is satisfactory, a fault is indicated within the tachograph. In this instance, remove the tachograph from the vehicle and return it to an authorised agent. Refer to Operation No. 33–274 for removal and installation procedure.

   Should either, or both, drive cables be broken, refer to Operation No. 33–376 to effect a replacement.

SERVICE ADJUSTMENTS AND CHECKS

At specified service intervals the following items should be checked to ensure correct function.

1. Operation of all interior lights including facia panel lights and automatic transmission lever quadrant light where fitted.
2. Operation of warning lights including brake warning light where fitted.
3. All switches and controls, (to include heated rear window switch where fitted).
4. Speedometer or tachograph operation, which should be checked either by road or roller test.

BULB REPLACEMENT

24 Hours, Single Driver

1. With the vehicle stationary, open the front of the tachograph.
2. Remove the failed bulb and holder, by twisting anti-clockwise.
3. Pull the failed bulb from the holder and replace with a new one.
4. Fit the new bulb and holder.
5. Close the tachograph and check the operation of the bulb.

24 Hours, Dual Driver

1. With the vehicle stationary, open the front of the tachograph.
2. Lift-up the bulb contact, remove the failed bulb by rotating, remove the bulb. Alternatively the bulb can be removed by pressing a small amount of plasticine onto the bulb contact, and lifting the bulb from its socket.
3. Fit a new bulb and retain the bulb contact.
4. Close the tachograph and check the operation of the bulb.

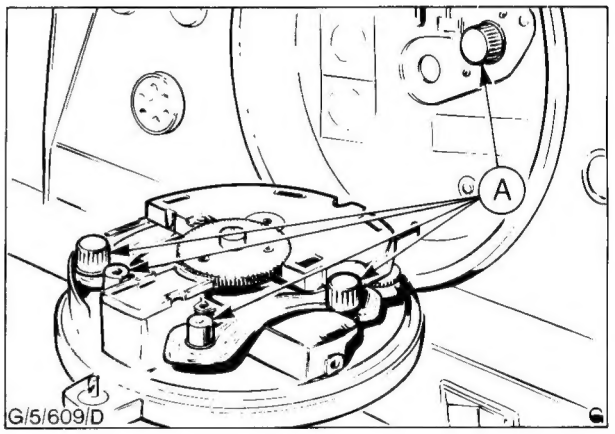


Fig. 6. A – Bulb holders and their locations

SPECIAL SERVICE TOOL RECOGNITION
EUROPEAN SOURCED

Tool	Tool Name
23–009	Fuel tank sender unit lock ring wrench

SERVICE AND REPAIR OPERATIONS – CONTENT 'A'

INTERIOR LIGHTS, INSTRUMENTS INSTRUMENT PANEL CONTROLS AND SENDER UNITS		Described in this Publication	Contained in Operation	Unique to Transit
33 128	Bulb – Heater control illuminating lamp – Replace	X		X
33 139	Bulb – Brake fluid warning – Replace	X		X
33 152	Lamp – Engine compartment – Remove and Install	X		X
33 154	Bulb – Engine Compartment lamp – Replace	—	33 154	X
33 214	Instrument cluster assembly – Remove and Install	X		X
33 228 4	Bulb instrument cluster – Replace (Instrument cluster removed)	—		X
33 244	Regulator – Instrument voltage – Remove and Install (variants with a tachograph)	X		X
33 274	Tachograph assembly – Remove and install	X		X
33 275	Bulb – Tachograph illumination – Replace – (One)	X		X
33 276	Cable – Tachograph – Remove and Install	X		X
33 284	Gauge – Fuel – Remove and Install (variants with a tachograph)	—	33 244	X
33 286	Sender unit – Fuel tank – Remove and Install	—	23 554	X
33 304	Gauge – Temperature – Remove and Install (variants with tachograph)	X		X
33 307	Sender Unit – Vacuum warning light – Remove and Install	X		X
33 384	Cigarette lighter assembly – Remove and Install	X		X
33 512	Switch – Ignition – Remove and Install	X		X
33 514	Switch – Light – Remove and Install	X		X
33 522	Switch – Direction indicator – Remove and Install	X		X
33 542	Switch – Windscreen wiper – Remove and Install	—	33 522	X
33 557	Switch – Rear fog lamp – Remove and install	—	33 522	X
33 575	Switch – Temperature sensing – Excess fuel – Remove and Install	X		X
33 576	Switch – Engine stop control motor – Remove and Install	X		X
33 601	Timer switch – Glow-plug operating – Remove and Install	X		X
33 602	Switch – Temperature sensing – Glow-plug control – Remove and Install	X		X
33 713	Relay – Headlamp washer system – Remove and Install	—	33 722	X
33 715	Relay – Windscreen wipers – Remove and Install	—	33 722	X
33 722	Relay – Indicator flasher – Remove and Install	X		X
33 724	Relay – Inhibitor switch – Remove and Install	X		X
33 726	Relay – Heated rear screen – Remove and Install	—	33 722	X
33 727	Relay – Glow-plug – Remove and Install	X		X
33 757	Solenoid – Excess fuel operating – Remove and Install	X		X
33 762	Relay – Engine stop control – Remove and Install	X		X

SERVICE AND REPAIR OPERATIONS – CONTENT 'B'

INTERIOR LIGHTS, INSTRUMENTS, INSTRUMENT PANEL CONTROLS AND SENDER UNITS	Described in this Publication	Contained in Operation	Also applicable to certain variants in the following model range					
			Transit '77	Fiesta	Escort '75 onwards	Capri	Taunus '76 Cortina '77	Granada '78
33 112 Lamp – Interior – Remove and Install – (One)	X		X	X	X	X	X	X
33 114 Bulb – Interior Lamp – Replace – (One)	—	33 112	X	X	X	X	X	X
33 134 Bulb – Quadrant lamp – Replace	X		—	—	X	X	X	X
33 139 Bulb – Brake fluid warning – Replace	X		X	X	X	X	X	X
33 144 Bulb – Warning Light – Heated rear window – Replace	X		X	X	X	X	X	X
33 146 Bulb – Hazard warning – Replace	X		X	X	X	X	X	X
33 224 4 Printed circuit – Instrument cluster – Remove and Install (instrument cluster removed)	X		—	X	X	X	X	X
33 226 4 Glass – Instrument cluster – Replace (instrument cluster removal)	X		—	X	X	X	X	X
33 244 4 Regulator – Instrument voltage – Remove and Install (instrument cluster removed) (variants with standard facia)	—	33 224 4	—	X	X	X	X	X
33 254 Head – Speedometer – Remove and Install	X		—	X	X	X	X	X
33 256 Cable – Speedometer – Inner and outer – Remove and Install	X							
33 284 Gauge – Fuel – Remove and Install (variants with standard facia)	X		—	X	X	X	X	X
33 304 Gauge – Temperature – Remove and Install (instrument cluster removed) (variants with standard facia)	—	33 284	—	X	X	X	X	X
33 306 Sender unit – Temperature – Remove and Install	X		X	X	X	X	X	X
33 374 Clock – Remove and Install	X		—	—	—	—	X	X
33 384 Cigarette lighter – Replace	X		—	X	X	X	X	X
33 386 Bulb – Cigarette lighter – Replace	—	33 384	—	X	X	X	X	X
33 513 Lock barrel – Ignition switch – Remove and Install	X		X	X	X	X	X	X
33 524 Switch – Courtesy light – Remove and Install	X		—	X	X	X	X	X
33 528 Switch – Back up lamp – Remove and Install	X		—	—	X	X	X	X
33 548 Switch – Stop light – Remove and Install	X		X	X	X	X	X	X
33 554 Switch – Oil pressure warning light – Replace	X		X	X	X	X	X	X
33 557 Switch – Fog lamp rear – Remove and Install	X		X	X	X	X	X	X
33 558 Switch – Hazard warning – Remove and Install	—	33 146	X	X	X	X	X	X
33 572 Switch – Heated rear window – Remove and Install	—	33 144	X	X	X	X	X	X
33 574 Switch – Heater motor – Remove and Install	X		X	X	X	X	X	X

SERVICE AND REPAIR OPERATIONS – CONTENT A

33 128 BULB – HEATER CONTROL ILLUMINATION PANEL REPLACE

Special Service Tools Required: None

To Remove

1. Ensure vehicle parking lights are turned off.
2. Remove facia trim panel by releasing six screw clips, Fig. 7.

   NOTE: If vehicle is fitted with a radio, first remove radio knobs and radio surround bezel.
3. Reach behind heater controls, unplug bulb and socket from heater panel and remove wedge-type bulb, Fig. 8.

To Replace

4. Fit new bulb, reconnect bulb and socket into heater facia.
5. Position facia panel, align six screw clips, and secure by rotating clips through 90°.

   If vehicle is fitted with a radio, position radio surround and fit radio knobs.
6. Test operation of bulb.

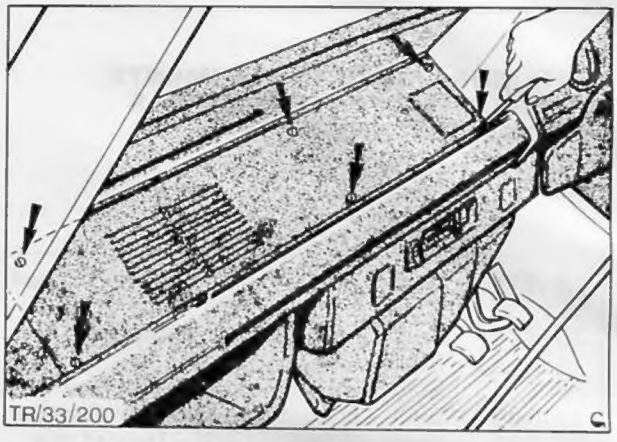


Fig. 7. Release facia trim panel by rotating six screws, (arrowed) through 90°

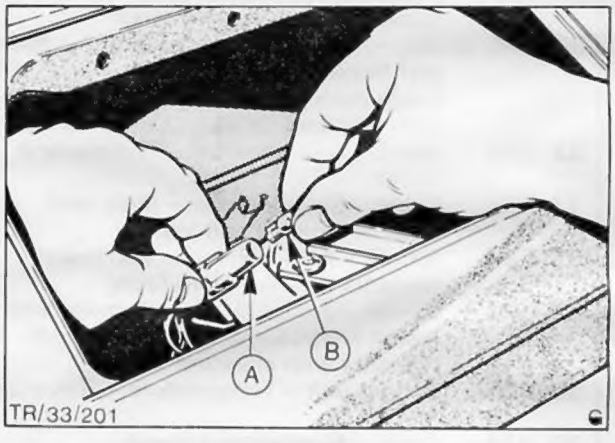


Fig. 8. Heater control light
A – Light socket
B – Bulb

33 139 BULB – BRAKE FLUID WARNING – REPLACE

Special Service Tools Required: None

To Remove

1. Ensure vehicle ignition is switched off.
2. Using a soft cloth or a wad of paper, cover instrument cluster bezel area immediately below switch location.
3. Using a small electrical screwdriver, pivoting on protective material, prise warning light panel from its bezel location, Fig. 9.

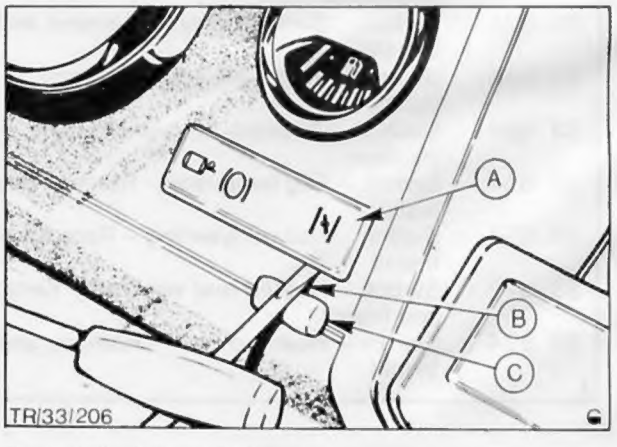


Fig. 9. Removing warning lamp panel
A – Warning lamp panel
B – Screwdriver
C – Protective wad

PART 'A'

4. Unplug applicable bulb socket and remove wedge-type bulb, Fig. 10.

To Replace

5. Fit new bulb and plug socket into warning light panel.
6. Align warning lamp panel with bezel aperture and clip into position.

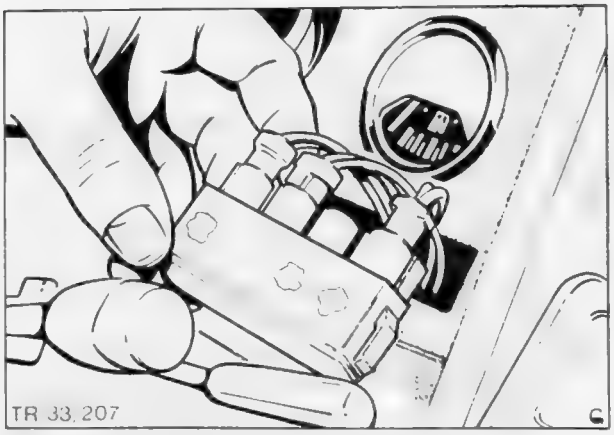


Fig. 10. Unplug warning lamp body complete with bulbs

33 152 LAMP – ENGINE COMPARTMENT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Unplug bayonet-type bulb from its socket, Fig. 11.
3. Disconnect wire from engine compartment loom, and unthread from hood panel strengthening struts.
4. Unscrew single retaining screw and detach lamp body.

To Install

5. Position lamp to hood panel, Fig. 12, and secure with single retaining screw.
6. Thread wire behind hood panel strengthening struts and connect to loom.
7. Plug bulb in its socket.
8. Reconnect battery, remove fender covers and close hood.

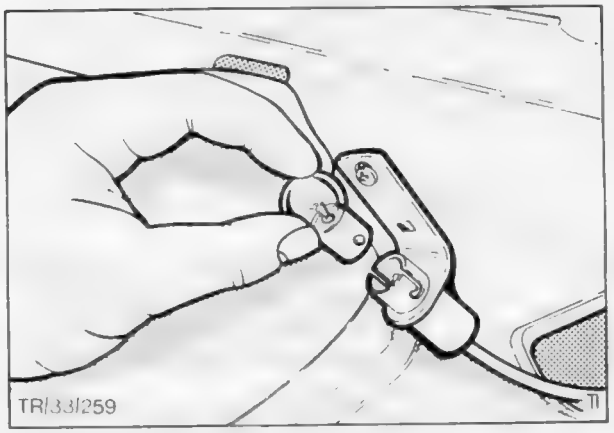


Fig. 11. Removing bulb

33 214 INSTRUMENT CLUSTER ASSEMBLY – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Unscrew single retaining screw and remove steering column upper shroud.
3. Remove two securing screws and lift instrument housing shroud from its location, on facia panel.

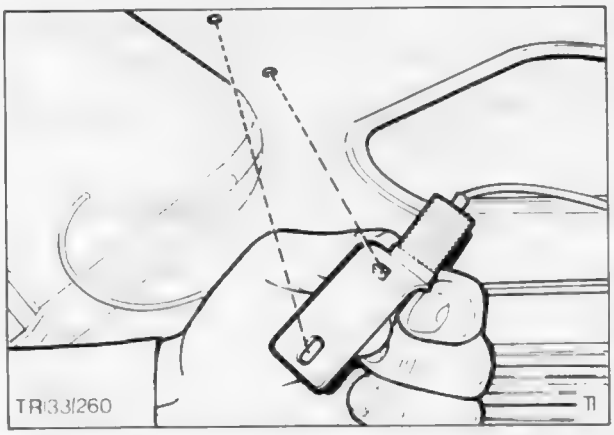


Fig. 12. Align locating peg in hole and elongated hole to screw hole

PART 'A'

4. Unscrew four instrument housing securing screws, and lift instrument housing to separate from facia panel.
5. Disconnect auxiliary switches from main loom at multi-plugs located at back of switches, Fig. 13.
6. Where applicable unplug warning lights from their sockets in auxiliary warning light panel.
7. Disconnect two multi-plugs where they connect to instrument cluster, Fig. 14.
8. Disconnect speedometer drive cable by depressing outer sleeve and releasing retaining peg, Fig. 15. Guide instrument cluster housing, complete with switches and auxiliary warning light panel (where applicable) clear of facia panel.

To Install

9. Approximately position instrument cluster housing assembly and reconnect speedometer drive cable.
10. Connect two loom multi-plugs to their respective sockets in rear of instrument cluster.
11. Where applicable plug warning lights into their respective sockets in auxiliary warning light panel.

    NOTE: The bulb sockets are colour coded to correspond to matching paint spots on lamp bodies. This ensures that bulbs are not accidentally plugged into the wrong sockets.
12. Reconnect auxiliary switches to their respective loom multi-plugs.
13. Align instrument housing assembly to facia panel and secure with four cross-head screws.
14. Position instrument housing shroud and secure with two cross-head screws.
15. Locate steering column upper shroud and secure with single cross-head screws.
16. Reconnect battery and test all gauges and warning lights for correct function. If a clock is fitted, reset to correct time.
17. Remove fender covers and close hood.

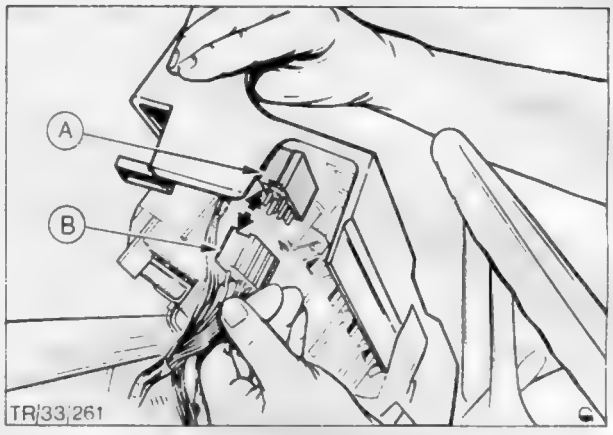


Fig. 13 Disconnecting switches
A Switch
B Multi-plug

Fig. 14. Disconnecting multi-plugs
A – Two multi-plugs

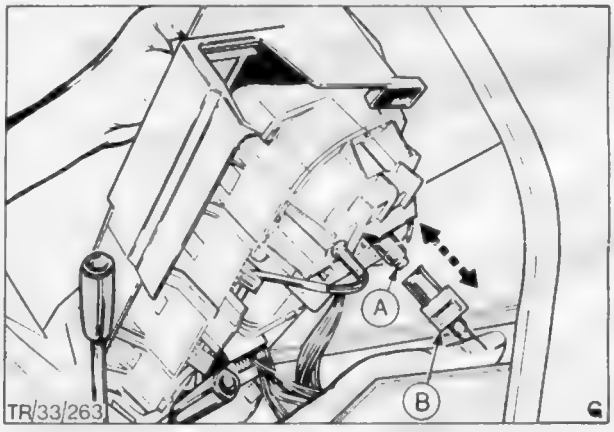


Fig. 15. Disconnecting speedo cable
A – Speedometer
B – Retaining peg (sleeve)

PART 'A'

33 214 INSTRUMENT CLUSTER ASSEMBLY – REMOVE AND INSTALL (Variants fitted with a tachograph)

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Unscrew single retaining screw and remove steering column upper shroud.
3. Remove two securing screws, Fig. 14, and lift instrument housing shroud from its location, on facia panel.
4. Unscrew four instrument housing securing screws, Fig. 15, and lift instrument housing to separate from facia panel.
5. Disconnect auxiliary switches from main loom at multi-plugs located at back of switches.
6. Unplug warning lights from their sockets in warning light panels.
7. Disconnect three wires and illumination bulb/socket from fuel gauge.
8. Disconnect two wires from voltage regulator.
9. Disconnect two wires and illumination bulb/socket from temperature gauge.
10. Guide instrument cluster housing, complete with switches, warning light bodies and auxiliary instruments, clear of facia panel, Fig. 18.

To Install

11. Approximately position instrument housing assembly and reconnect three fuel gauge wires and illumination bulb/socket.
12. Reconnect two wires to voltage regulator.
13. Reconnect two temperature gauge wires and illumination bulb/socket.
14. Plug warning lights into their respective sockets in warning lamp cluster.

    NOTE: The bulb sockets are different colours to correspond to matching paint spots on lamp bodies. This ensures that bulbs are not accidentally plugged into the wrong sockets.
15. Connect auxiliary switches to their respective multi-plugs on main loom.
16. Align instrument housing assembly to facia panel and secure with four cross-head screws.
17. Position instrument housing shroud and secure with two cross-head screws.
18. Locate steering column upper shroud and secure with single cross-head screw.
19. Reconnect battery and test all gauges and warning lights for correct function.
20. Remove fender covers and close hood.

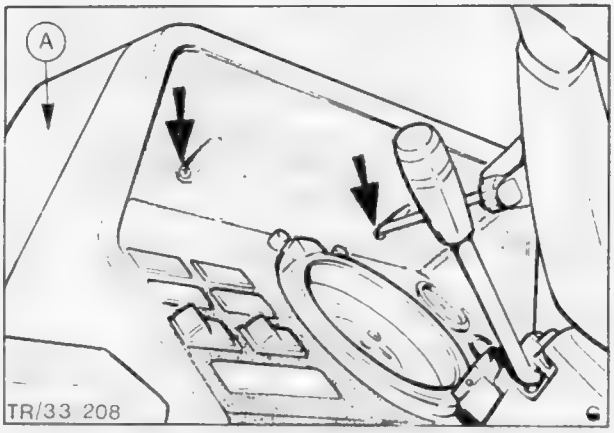


Fig. 16. Removing housing shroud. Retaining screws arrowed
A - Shroud

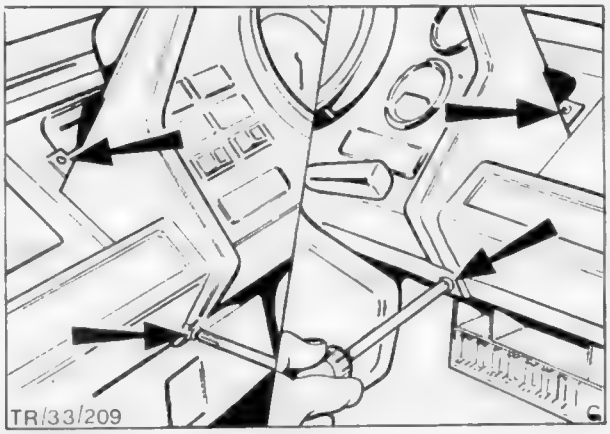


Fig. 17. Instrument housing removal
Securing screws are arrowed

Fig. 18. Guide housing assembly from facia panel

PART 'A'

33 244 REGULATOR – INSTRUMENT VOLTAGE – REMOVE AND INSTALL (Variants equiped with a tachograph)

NOTE: For variants without a tachograph refer to Operation No. 33–224

Special Service Tools Required: None

To Remove

1. Open hood fit fender covers and disconnect battery.
2. Unscrew single cross-head screw and remove upper steering column shroud.
3. Unscrew and detach instrument cluster shroud.
4. Unscrew four instrument housing securing screws and carefully lift instrument housing to separate from facia panel.
5. Disconnect wires from fuel gauge and voltage regulator, Fig. 19. Unplug gauge illumination socket.
6. Unscrew two knurled fasteners and remove fuel gauge and bracket from facia, Fig. 20.
7. Remove voltage regulator from fuel gauge retaining bracket.

To Install

8. Secure regulator to fuel gauge bracket using screw, shakeproof washer, flat washer and nut, Fig. 21.
9. Assemble gauge in facia and secure with bracket and two knurled fasteners.
10. Reconnect two wires to voltage regulator and three wires to fuel gauge. Plug in fuel gauge illumination socket.
11. Align instrument housing assembly and secure with four cross-head screws.
12. Position instrument housing shroud and secure with two screws.
13. Position steering column upper shroud and secure with single screw.
14. Reconnect battery, remove fender covers and close hood.

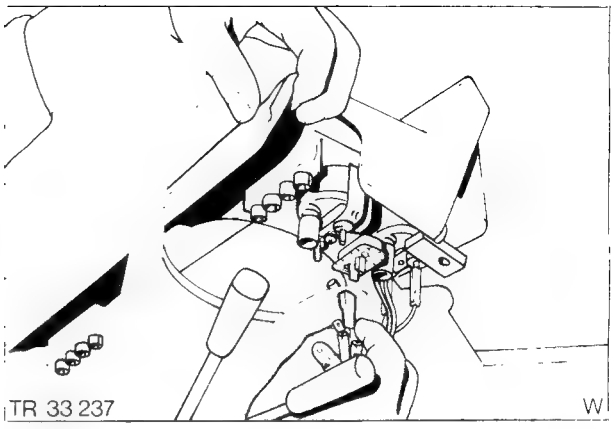


Fig. 19. Disconnecting wires from fuel gauge and regulator

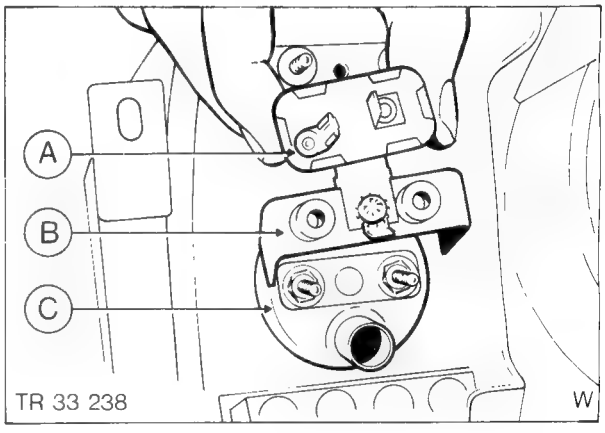


Fig. 20. Removing regulator
A – Regulator
B – Fuel gauge bracket
C – Fuel gauge

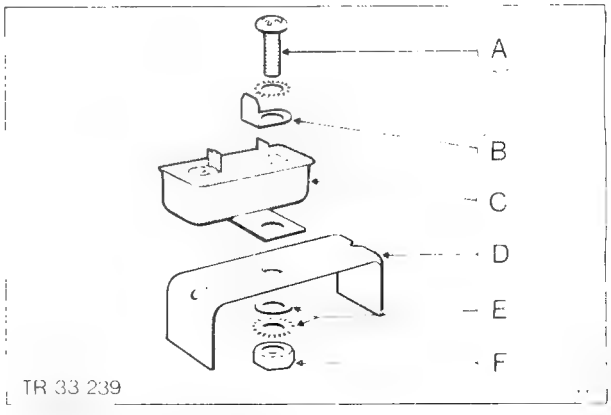


Fig. 21. Assembling regulator
A Securing screw
B Earth terminal
C Regulator
D Bracket
E Flat and shakeproof washers
F Securing nut

PART 'A'

33 274 TACHOGRAPH ASSEMBLY – REMOVE AND INSTALL

Special Service Tools Required: None

NOTE: Vehicles operating in territories where full tachograph legislation is in force will have seals applied at the drive cable ends. The following procedure necessitates disturbing these seals (if fitted). It is therefore, important that these seals are renewed before the vehicle is returned to service.

To Remove

1. Remove instrument cluster housing from facia panel as described in Operation No. 33–214 Sub Operations 1 to 11.
2. Unscrew four cross-head screws securing tachograph and bracket to facia panel, Fig. 22.
3. Disconnect tachograph loom at multi-plug, Fig. 23.
4. Disconnect drive cable by removing seal (where applicable), releasing collar securing key, Fig. 24, and twisting cable retaining collar anti-clockwise. Lift tachograph and bracket assembly clear of facia.

To Install

5. Connect drive cable to tachograph and lock cable retaining collar in position using collar securing key. Renew seal (where applicable).
6. Align tachograph bracket to facia panel, and secure with four cross-head screws.
7. Connect tachograph loom at multi-connector.
8. Refit instrument housing cluster to facia as described in Operation No. 33–214, Sub Operations 12 to 20.

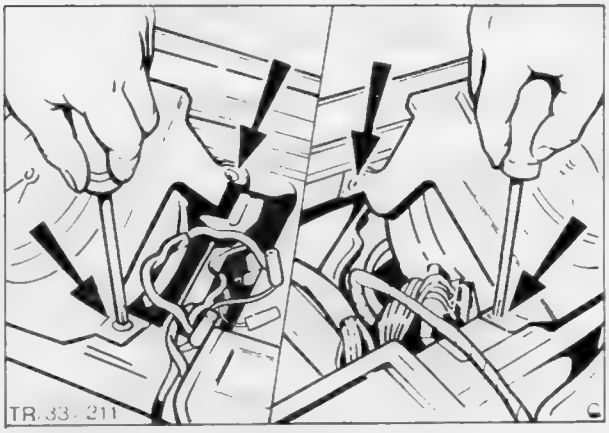


Fig. 22. Removing securing screws
Four screws are arrowed

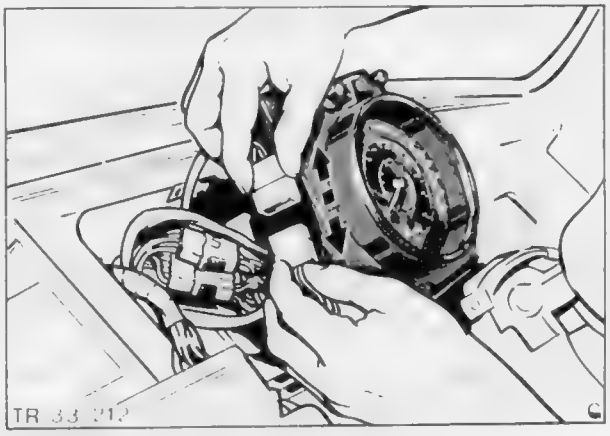


Fig. 23. Disconnect tachograph electrics at multi-plug

33 275 BULB – TACHOGRAPH ILLUMINATION – REPLACE ONE

For details on the replacement of tachograph bulbs refer to Service Adjustments and Checks on page 7.

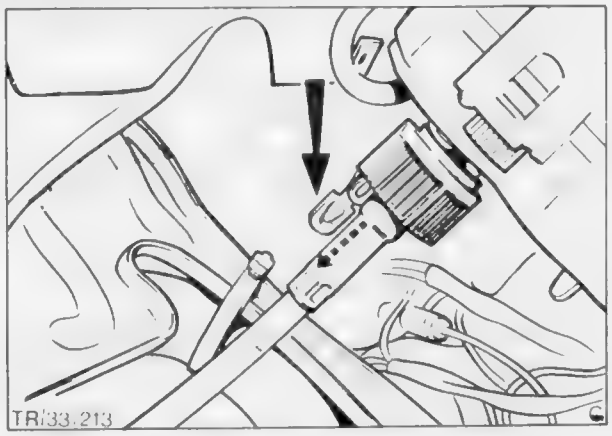


Fig. 24. Release drive cable securing collar locking key
(Key shown in 'out' position)

PART 'A'

33 276 CABLE – TACHOGRAPH – REMOVE AND INSTALL

Special Service Tools Required: None

NOTE: 1. This operation covers the removal and installation of the complete cable for a 'two-cable' system. The same principals can be applied when replacing the cable on a 'single cable' variant.

2. Vehicles operating in territories where full tachograph legislation is in force will have seals applied at the cable ends. The following procedure necessitates disturbing these seals (if fitted). It is therefore, important that these seals are renewed before the vehicle is returned to service.

To Remove

1. Remove tachograph assembly as described in Operation No. 33–274, Sub Operations 1 to 4.
2. Guide drive cable through bulk-head aperture. Remove seal (where fitted) (see note two).
3. Remove seal (where applicable), unscrew drive cable retaining nut at reduction box and remove upper section of cable from vehicle, Fig. 26.
4. Remove seal (where fitted), cable clamp and bolt at gearbox and remove cable from gearbox drive, Fig. 27.
5. Remove seal (where fitted), unscrew drive cable retaining nut at reduction box and remove lower section of cable from vehicle.

   NOTE: Lower drive cable retaining nut at reduction box has a left-hand thread.

To Install

6. Align lower section of cable and connect to reduction box using the left-hand threaded nut.
7. Position cable into drive gear in gearbox and secure using clamp and bolt.
8. Guide upper cable through bulkhead and position behind facia. Position bulkhead grommet.
9. Connect cable to reduction box and secure with retaining nut.
10. Connect cable to tachometer and fit new seals at appointed locations. Refit tachograph as described in Operation No. 33–274, Sub Operations 5 to 8.

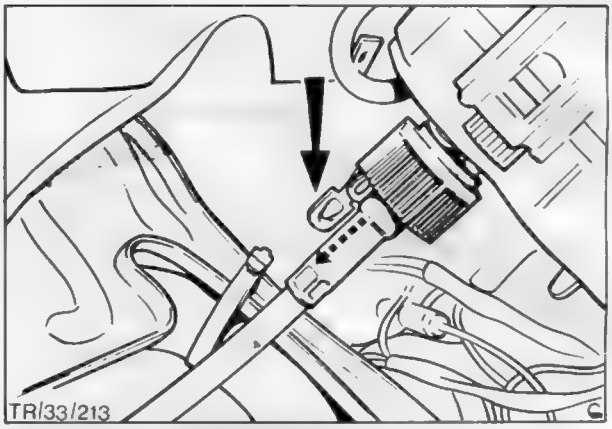


Fig. 25. Release drive cable collar securing key (Key shown in 'out' position)

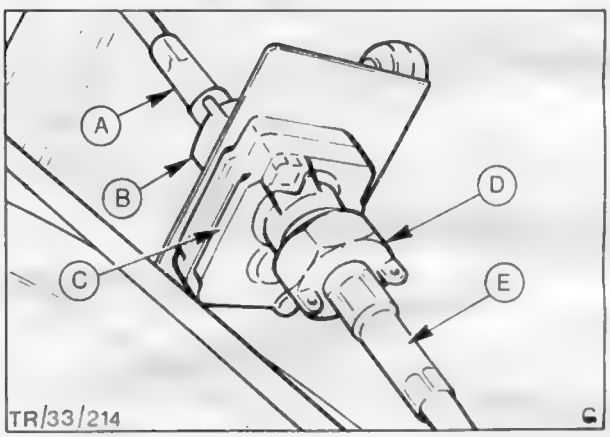


Fig. 26. Calibration box and cables
A – Upper cable
B – Cable retaining nut (right-hand thread)
C – Calibration box
D – Cable retaining nut (left-hand thread)
E – Lower cable

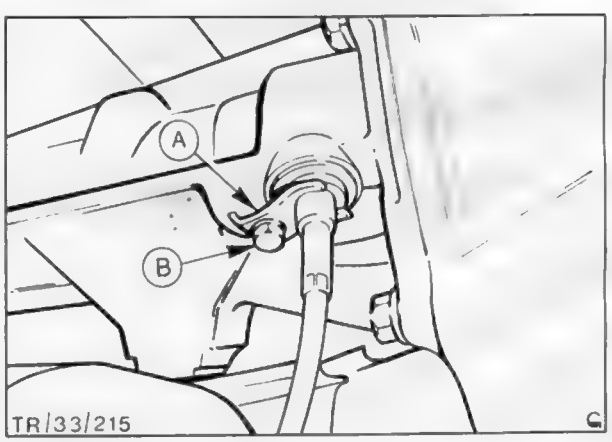


Fig. 27. Cable at gearbox end
A – Cable clamp
B – Securing bolt

PART 'A'

33 304 GAUGE – TEMPERATURE – REMOVE AND INSTALL (Variants fitted with a tachograph)

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Unscrew single retaining screw and remove steering column upper shroud.
3. Remove two securing screws and lift instrument housing shroud from its location on facia panel.
4. Disconnect two temperature gauge wires and illumination bulb/socket.
5. Remove two knurled fasteners, detach gauge retaining bracket and guide gauge from facia panel.

To Install

6. Align gauge in facia aperture and secure by fitting retaining bracket and two knurled fasteners. Fig. 28.
7. Reconnect illumination bulb/socket and two gauge wires. Fig. 29.
8. Position instrument housing shroud on facia and secure with two cross-head screws.
9. Align upper steering column shroud and secure with single cross-head screw.
10. Connect battery, remove fender covers, and close hood.

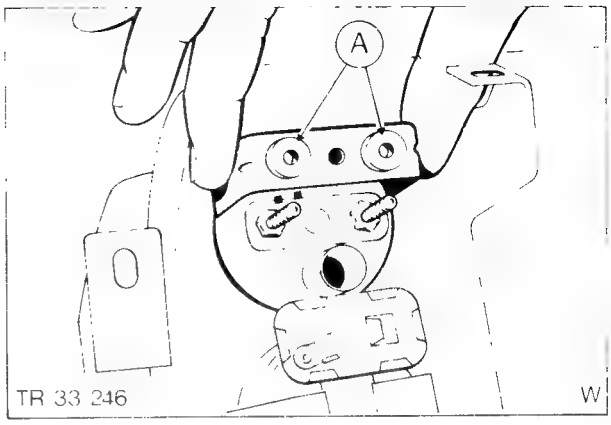


Fig. 28. Aligning guage securing bracket. Ensure plastic insulators 'A', are correctly positioned and not damaged

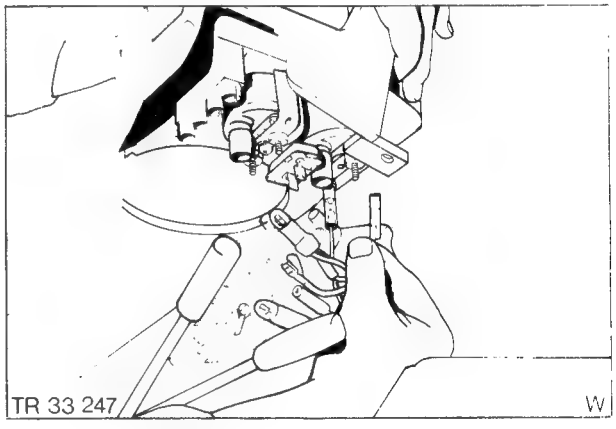


Fig. 29. Connecting wires to guage

33 307 SENDER UNIT – VACUUM WARNING LIGHT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Disconnect lead from sender unit.
3. Unscrew sender unit from servo unit, Fig. 30.

To Install

4. Screw sender unit into aperture in servo.
5. Connect wire to sender unit.
6. Reconnect battery, remove fender covers, and close hood.

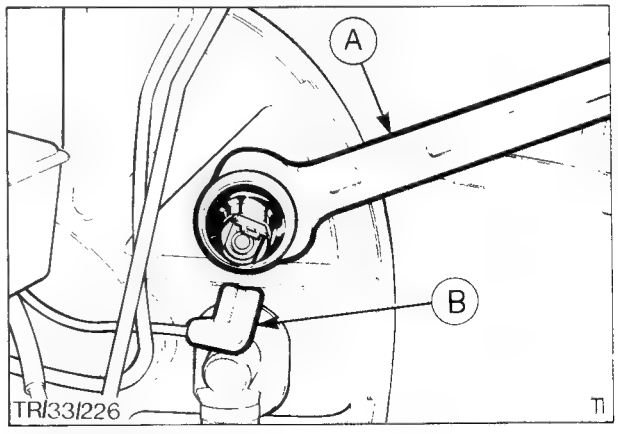


Fig. 30. Unscrew sender unit
A Spanner
B Loom connector

PART 'A'

33 512 SWITCH – IGNITION – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Remove single retaining screw, and detach steering column upper shroud.
3. Remove two screws and detach both lower steering column shrouds, Fig. 31.

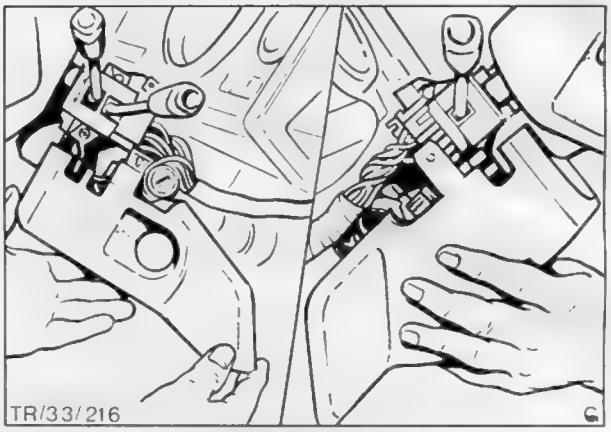


Fig. 31. Removing two lower steering column shrouds

4. Remove two bolts that secure steering column assembly to facia panel. Allow steering column to rest in a lowered position.
5. Using a suitable drift, (e.g. small chisel or pin punch), and a hammer tap out two 'shear' bolts securing ignition switch to steering column, Fig. 33.
6. Disconnect switch assembly from main loom at multi-plug.

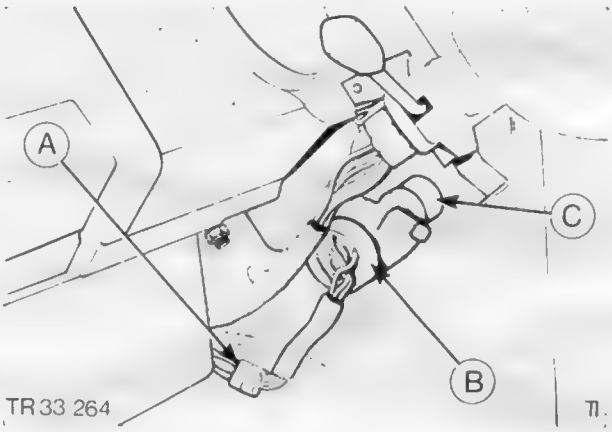


Fig. 32. Switch assembly
A - Loom multi-plug
B Ignition switch
C Lock barrel

To Install

7. Connect ignition switch to loom at multi-plug, Fig. 32.
8. Position switch assembly on steering column ensuring that lock part engages with steering column cut-out. Secure with two new 'Shear' bolts. Check function of lock, then tighten bolts until heads shear off.
9. Reposition steering column and secure to facia with two bolts.
10. Align left and right-hand lower sections of steering column shrouds and secure with two cross-head screws.
11. Align steering column upper shroud and secure with single cross-head screw.
12. Reconnect battery, remove fender covers and close hood.

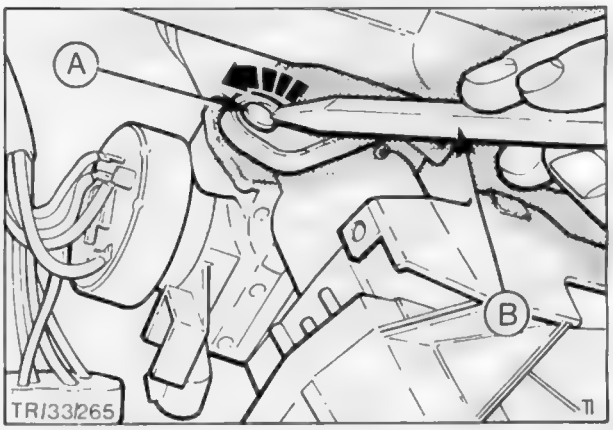


Fig. 33. Chiselling-out shear bolts to release lock
A - Shear bolt
B Chisel

PART 'A'

33 514 SWITCH – LIGHT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers, and disconnect battery.
2. Unscrew three retaining screws and remove five steering column shroud sections.
3. Remove two cross-head screws and separate direction indicator switch, light/windscreen wiper switch and steering column shroud bracket from around steering column.
4. Unplug light/windscreen wiper switch from loom, Fig. 34.

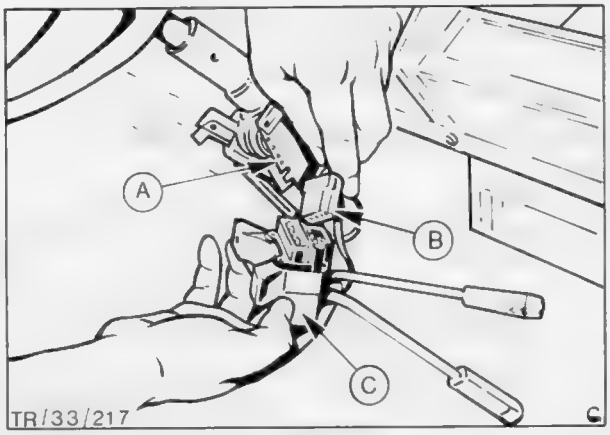


Fig. 34. Disconnecting switch
A – Multi-plug to wiper switch
B – Multi-plug to light switch
C – Switch

To Install

5. Plug switch into loom multi-plugs.
6. Align indicator switch, steering column shroud bracket, and light/windscreen wiper switch around steering column, Fig. 35, and secure with two cross-head screws.

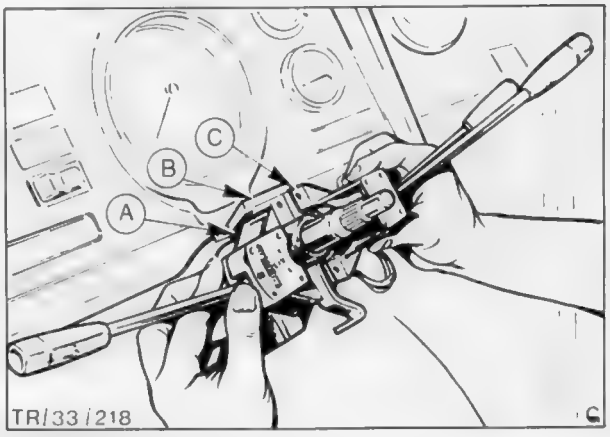


Fig. 35. Aligning switches to column
A – Multi-function switch
B Shroud bracket
C – Wiper/light switch
NOTE: Steering wheel removed for clarity

NOTE: Lower screw also retains earth wires, which must be connected to screw before it is fully tightened, Fig. 36.

7. Align left and right-hand steering column lower shrouds and secure with four cross-head screws.
8. Align steering column upper shroud and secure with single cross-head screw.
9. Reconnect battery, remove fender covers and close hood.

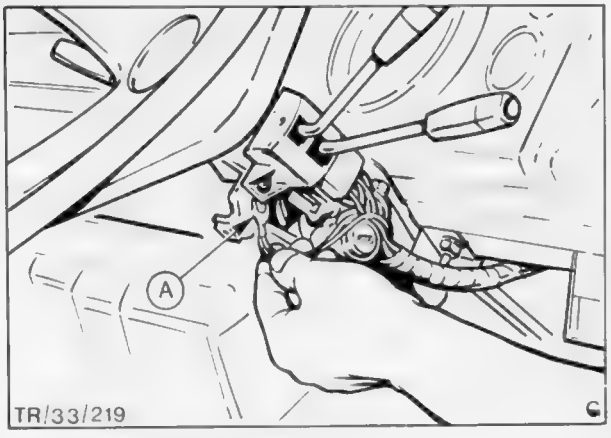


Fig. 36. Connecting earth lead
A Earth lead

PART 'A'

33 522 SWITCH – DIRECTION INDICATOR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Unscrew five retaining screws and remove three steering column shroud sections.
3. Remove two cross-head screws and separate direction indicator switch from steering column shroud bracket and light/windscreen wiper switch.
4. Unplug indicator switch from two loom plugs, Fig. 37.

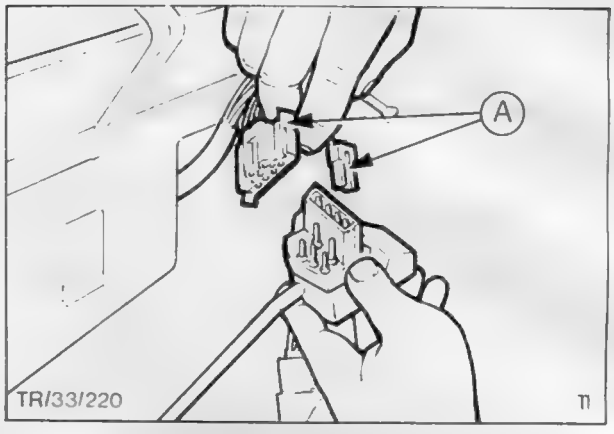


Fig. 37. Disconnecting switch
A Two multi-plugs

To Install

5. Connect indicator switch to loom with two multi-plugs.
6. Align indicator switch, Fig. 38, steering column shroud bracket, and windscreen wiper/light switch around steering column and secure with two cross-head screws, Fig. 39.

   NOTE: Lower screw also retains earth wires, which must be connected to screw before it is fully tightened.

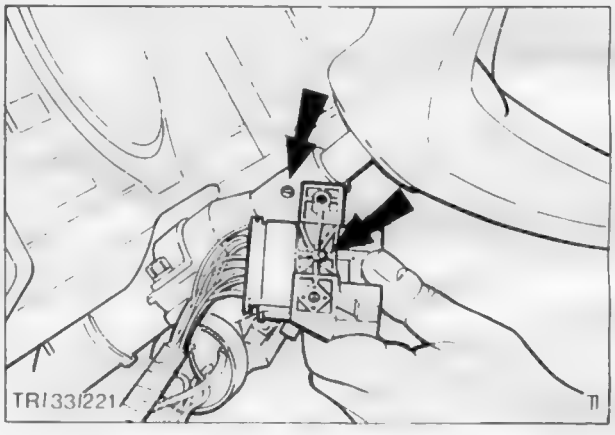


Fig. 38. Peg (arrowed) on switch locates in hole in steering column (arrowed)

7. Align left and right-hand steering column lower shrouds and secure with four cross-head screws.
8. Align steering column upper shroud and secure with single cross-head screw.
9. Reconnect battery, remove fender covers, and close hood.

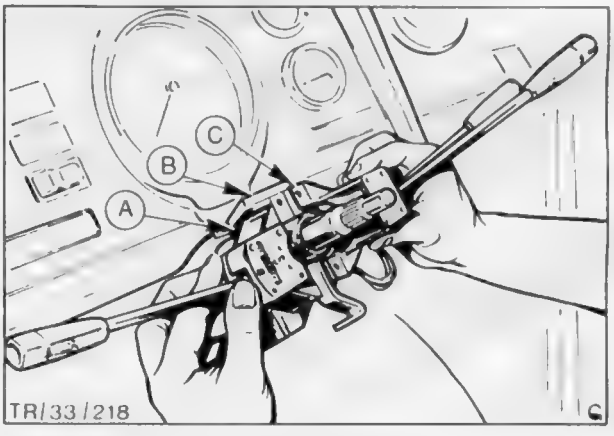


Fig. 39. Aligning switches to column
A Multi function switch
B Shroud bracket
C Wiper/light switch
NOTE: Steering wheel removed for clarity

PART 'A'

33 575 SWITCH – TEMPERATURE SENSING – EXCESS FUEL – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood and fit fender covers.
2. Disconnect battery.
3. Disconnect loom and unscrew switch from cylinger block, Fig. 40.

   NOTE: The switch is not fitted into a water gallery, therefore there is no requirement to drain cooling system.

To Install

4. Fit switch into cylinder, tighten and reconnect loom.
5. Reconnect battery.
6. Remove fender covers and close hood.

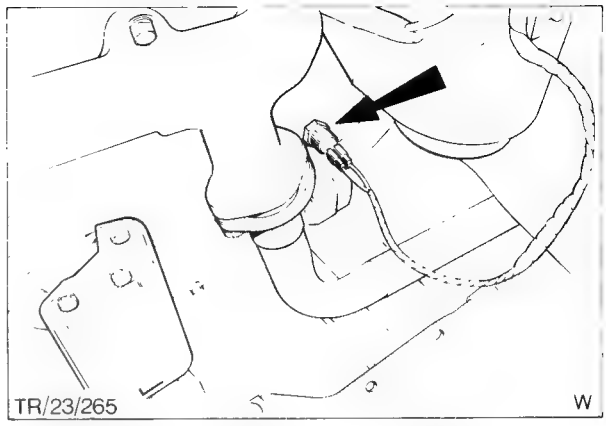


Fig. 40. Excess fuel temperature sensing switch

33 576 SWITCH – ENGINE STOP CONTROL MOTOR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Remove engine stop control motor as described in Operation No. 32–882, Sub Operations 2–4.
3. Remove two screws, nuts and spring washers and plastic dirt guard and detach switch from mounting bracket, Fig. 40A.
4. Disconnect switch from loom at multi-plug, Fig. 41.

To Install

5. Connect switch to loom at multi-plug.
6. Align switch and dirt guard to mounting bracket and secure with two screws, spring washers and nuts.

   NOTE: Care should be taken not to over-tighten screws as this could crack plastic switch body.
7. Refit engine stop control motor as described in Operation No. 32–882, Sub Operations 5 and 6.
8. Reconnect battery, remove fender covers and close hood.

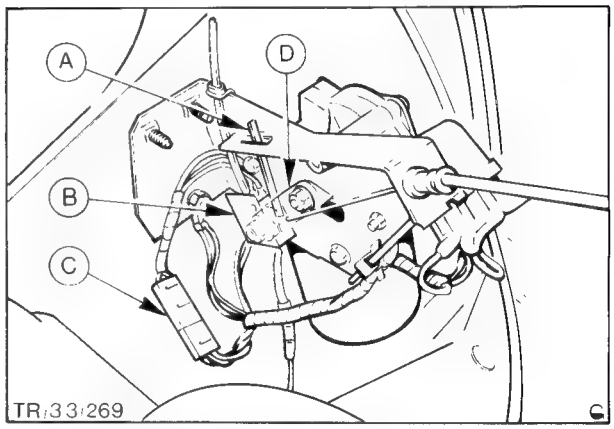


Fig. 40A. Detaching switch from mounting bracket
A – Switch operating lever
B – Plastic dirt guard
C – Loom plug
D – Actuating arm

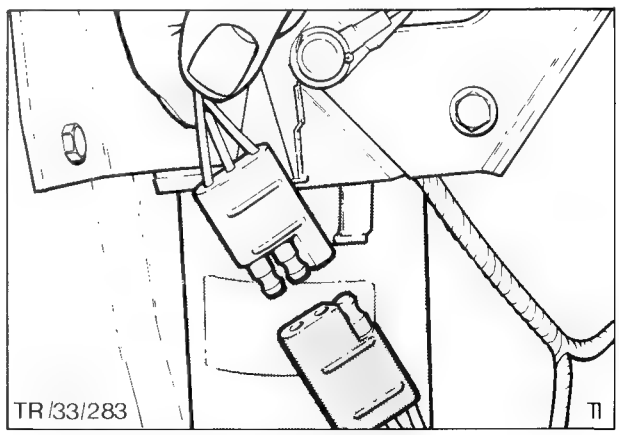


Fig. 41. Disconnecting loom plug

PART 'A'

33 601 TIMER – GLOW-PLUG – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Remove two securing screws and detach timer and protective shield from battery tray, Fig. 42.
3. Disconnect timer from loom.

To Install

4. Connect timer to loom with multi-plug.
5. Secure timer and protective shield to battery tray with two screws.
6. Re-connect battery remove fender covers and close hood.

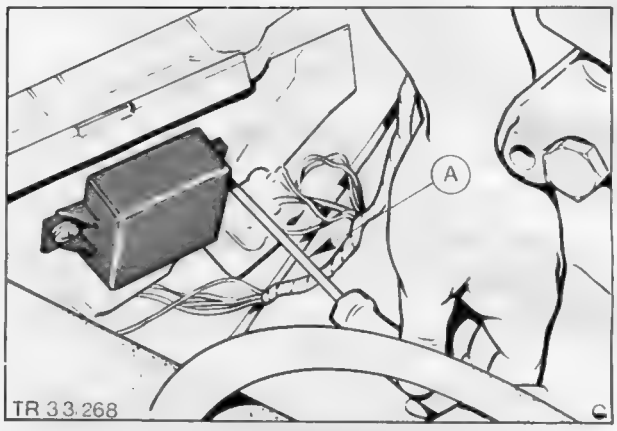


Fig. 42. Removing timer
A – Screwdriver

33 602 SWITCH – TEMPERATURE SENSING – GLOW-PLUG CONTROL – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood and fit fender covers.
2. Disconnect battery.
3. Disconnect loom and unscrew switch from cylinder head, Fig. 42A.

   NOTE: The switch is not fitted into a water gallery, therefore there is no requirement to drain the cooling system.

To Install

4. Fit switch into head, secure and reconnect loom.
5. Reconnect battery.
6. Remove fender covers and close hood.

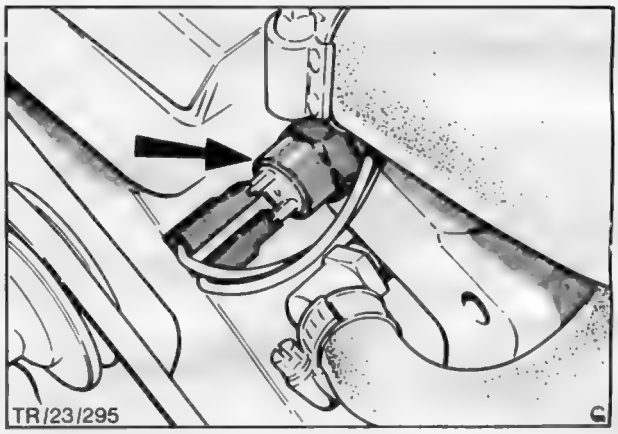


Fig. 42A. Glow Plug temperature sensing switch

PART 'A'

33 722 RELAY – INDICATOR FLASHER – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers, and disconnect battery.
2. Unclip relay from its location under facia panel, above hood release, Figs. 44 and 45.
3. Unplug relay from loom.

To Install

4. Plug relay onto loom multi-plug.
5. Clip relay to side panel under facia.
6. Reconnect battery, remove fender covers and close hood.

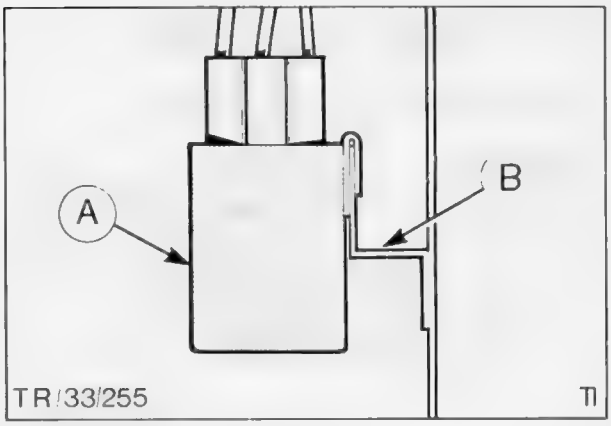


Fig. 43. Relay mounting
A – Relay
B – Cowl side panel

33 724 RELAY – INHIBITOR SWITCH – AUTOMATIC TRANSMISSION – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Detach relay from its location on underside of battery tray by removing single cross head screw.
3. Disconnect relay from loom.

To Install

4. Connect relay to loom.
5. Secure relay in position on battery tray using retaining screw.
6. Reconnect battery, remove fender covers, and close hood.

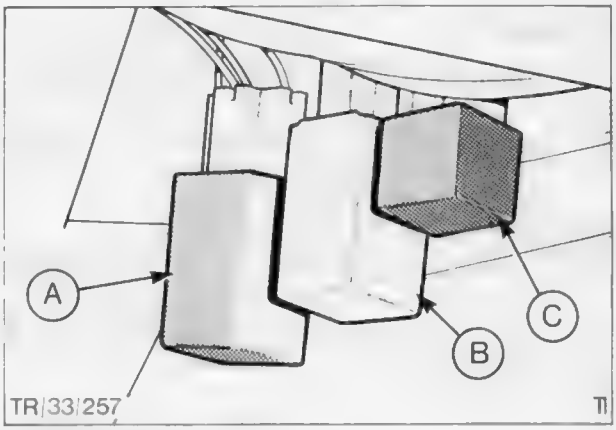


Fig. 44. Relay location
A – Direction indicator/Hazard flasher
B – Intermittent wiper relay
C – Heated rear screen relay (where relay fitted)

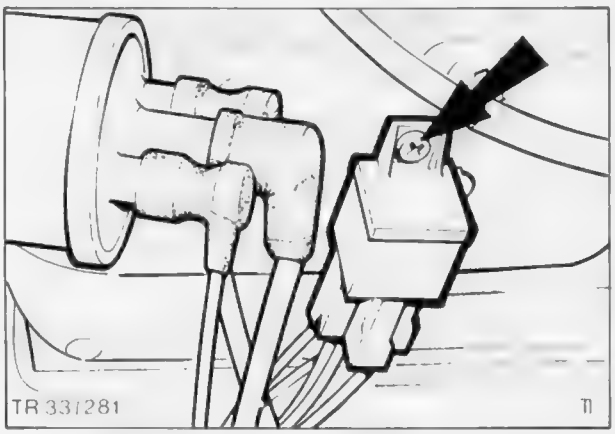


Fig. 45. Relay is secured by one cross head screw (arrowed)

PART 'A'

33 727 RELAY – GLOW-PLUG – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Detach relay from vehicle battery tray by removing securing screws, Fig. 46.
3. Disconnect individual wires from relay.

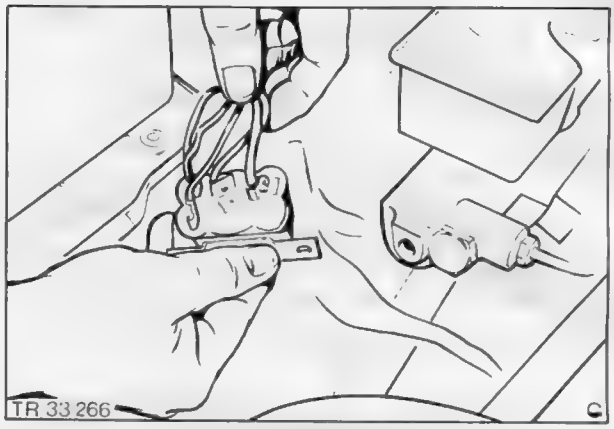


Fig. 46. The glow-plug relay location

To Install

4. Wires should be connect to relay as follows; (also refer to Fig. 47).

   Terminal 85 – Two brown wires
   Terminal 86 – Green wire
   Terminal 30 – Red wire
   Terminal G – Black/Brown wire

5. Secure relay in position on vehicle using two screws.
6. Reconnect battery, remove fender covers and close hood.

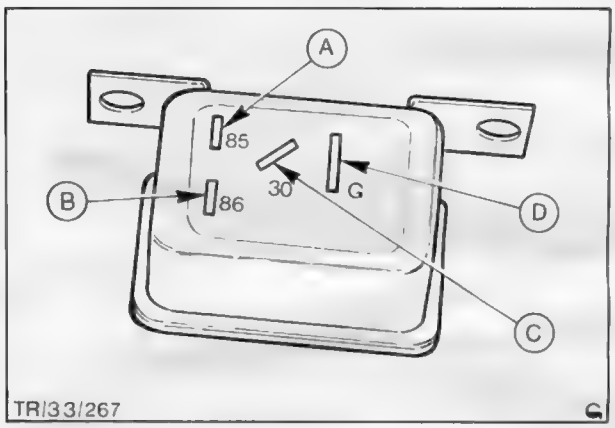


Fig. 47. Glow-plug relay connections
A – Twin brown
B – Green
C – Red
D – Black/Brown

33 757 SOLENOID – EXCESS FUEL OPERATING – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood and fit fender covers.
2. Disconnect battery.
3. Loosen adjusting clamp, 'C' in Fig. 47A, remove two screws, disconnect loom and detach solenoid.

To Install

4. Place solenoid in position and secure two screws.

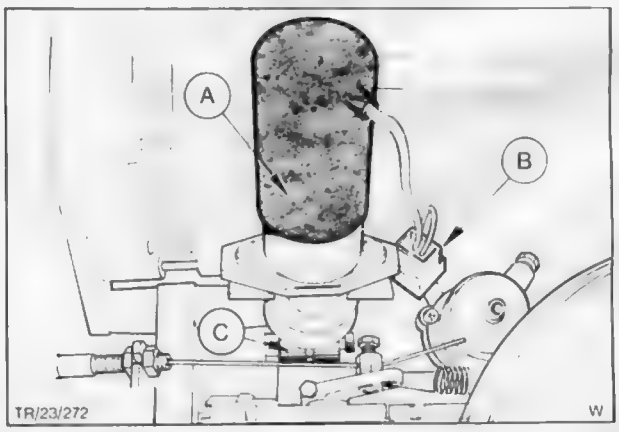


Fig. 47A. Excess fuel operating solenoid
A – Solenoid
B – Loom connection
C – Adjusting clamp

PART 'A'

5. Adjust solenoid control rod as follows, Fig. 47B.
   (a) Position a wedge of wood between mounting bracket and fuel button operating level, so excess fuel button is FULLY ENGAGED.
   (b) Fully engage solenoid by pushing control rod 'B' in Fig. 47B, upwards as far as possible.
   (c) Secure the control rod adjusting clamp and release wedge.
6. Reconnect loom to switch.
7. Ensure linkage is free to return to 'off' position.
8. Reconnect battery.
9. Remove fender covers and close hood.

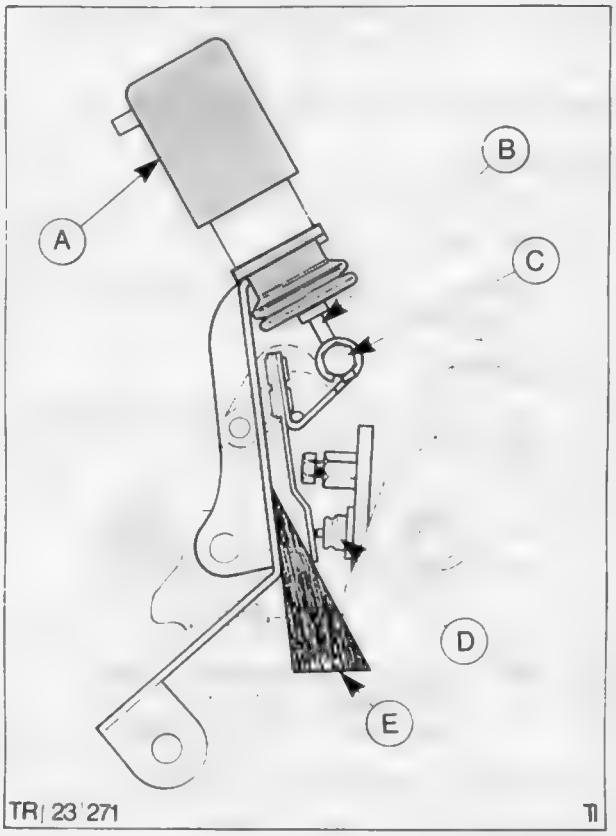


Fig. 47B. Excess fuel solenoid adjustment
A – Solenoid
B – Control rod
C – Adjusting clamp
D – Excess fuel button
E – Adjustment wedge

33 762 RELAY – ENGINE STOP CONTROL – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Disconnect wiring loom spade connectors from relay.
3. Remove two relay securing screws, nuts, flat and shakeproof washers, and detach relay from bracket assembly.

To Install

4. Position relay on bracket and secure with two screws, nuts, flat and shakeproof washers.
5. Reconnect loom spade connectors to relay as follows, (also refer to Fig. 48).

A – Black
B – Brown
C – Green
D – Blue
E – Yellow

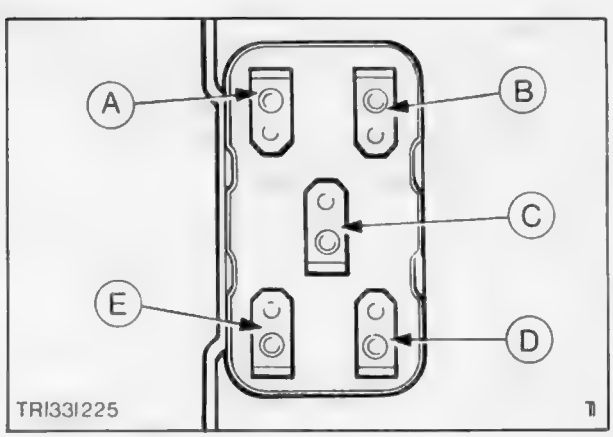


Fig. 48. Relay connections
A – Black
B – Brown
C – Green
D – Blue
E – Yellow

SERVICE AND REPAIR OPERATIONS – CONTENT 'B'

33 112 LAMP – INTERIOR – REMOVE AND INSTALL (ONE)

Special Service Tools Required: None

To Remove

1. Open hood and fit fender covers.
2. Disconnect battery.
3. Prise out lamp assembly, disconnect loom and detach bulb, Fig. 49.

To Install

4. Refit bulb to lamp, reconnect loom and clip assembly back into position.
5. Reconnect battery.
6. Check operation of lamp.
7. Remove fender covers and close hood.

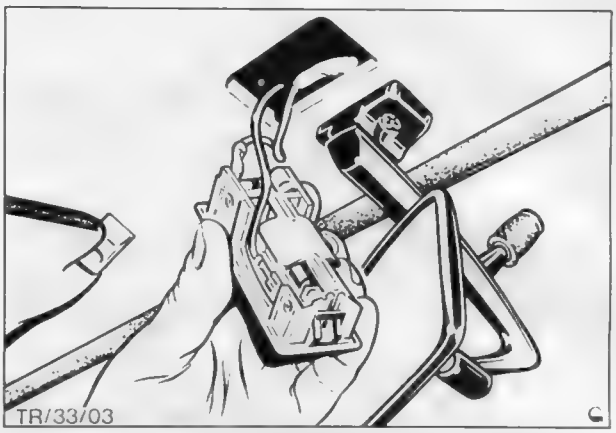


Fig. 49. Interior lamp removal

33 134 BULB – QUADRANT LAMP – REPLACE (Automatic variants only)

Special Service Tools Required: None

To Remove

1. Unclip selector housing and lift clear of selector mechanism, Fig. 50.
2. Slide out bulb holder from base of selector lever and detach bulb from holder, Fig. 51.

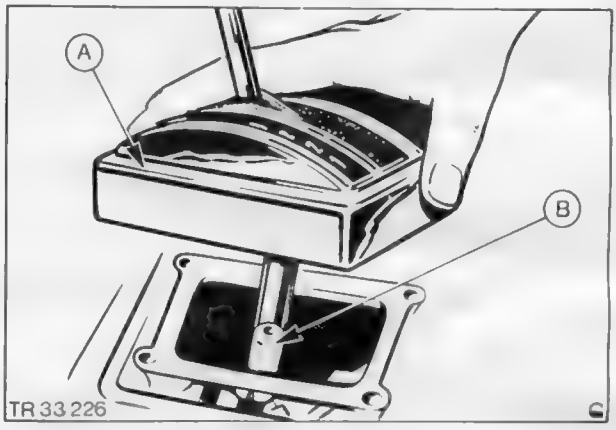


Fig. 50. Removal of selector housing
A – Selector housing
B – Quadrant lamp

To Install

3. Install bulb to holder and clip assembly in position.
4. Clip selector housing in position.
5. Check operation of bulb.

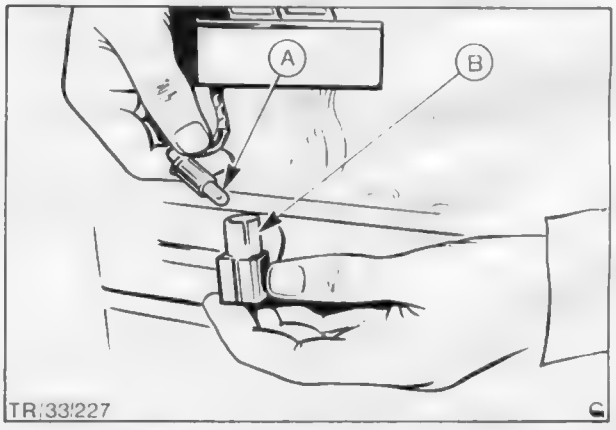


Fig. 51. Removal of quadrant bulb
A – Quadrant bulb
B – Quadrant bulb housing

PART 'B'

33 144 BULB – HEATED REAR WINDOW WARNING LIGHT – REPLACE

Special Service Tools Required: None

To Remove

1. Open hood fit fender covers and disconnect battery.
2. Using a soft cloth or a wad of paper, cover instrument cluster bezel area immediately below switch location.
3. Using a small electrical screwdriver, pivoting on protective material, prise switch from its bezel location, Fig. 52.
4. Detach multi-plug and bulb and remove switch. Unplug bulb, Fig. 53.

   NOTE: Bulb is push fit into socket, do not twist to remove.

To Replace

5. Fit new bulb into holder.
6. Insert bulb holder into switch body, Fig. 53, connect loom connectors to rear of switch.
7. Position switch in bezel aperture and push home to secure.
8. Reconnect battery, and check switch for correct function. Remove fender covers and close hood.

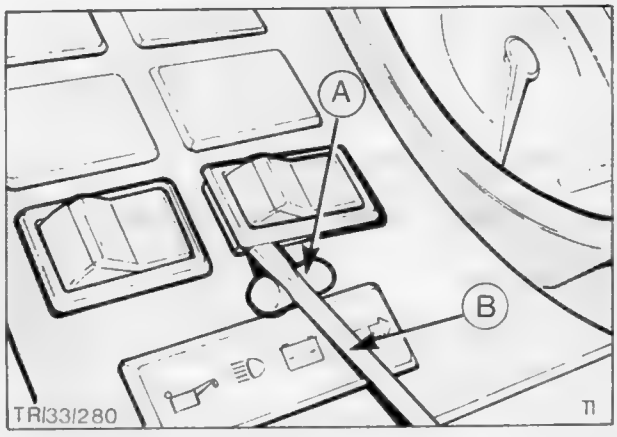


Fig. 52. Removing switch
A – Protective material
B – Screwdriver

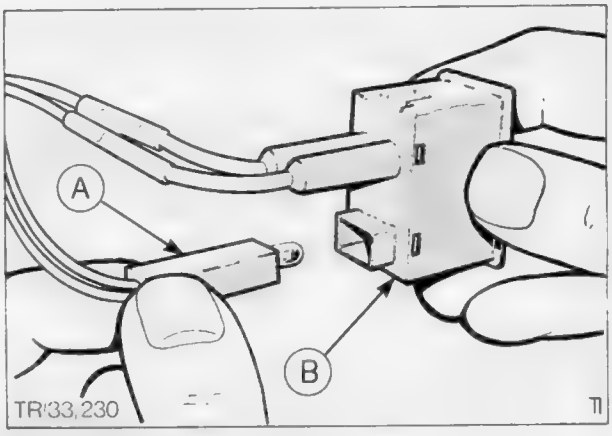


Fig. 53. Removing bulb and holder
A – Bulb holder
B – Switch body

33 146 BULB – HAZARD WARNING – REPLACE

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers, and disconnect battery.
2. Using a soft cloth or a wad of paper, cover instrument cluster bezel area immediately below switch location, Fig. 54.
3. Using a small electrical screwdriver, pivoting on protective material, prise switch from its bezel location.
4. Detach multi-plug and remove switch.
5. Carefully prise bulb holder and bulb from rear of switch, Fig. 53. Pull bulb out of socket.

   NOTE: Bulb is a push fit into socket, do not twist to remove.

To Replace

6. Fit new bulb into holder.
7. Insert bulb holder in switch body, connect loom multi-plug to rear of switch.
8. Position switch in bezel aperture and push home to secure.
9. Reconnect battery and check switch for correct function. Remove fender covers and close hood.

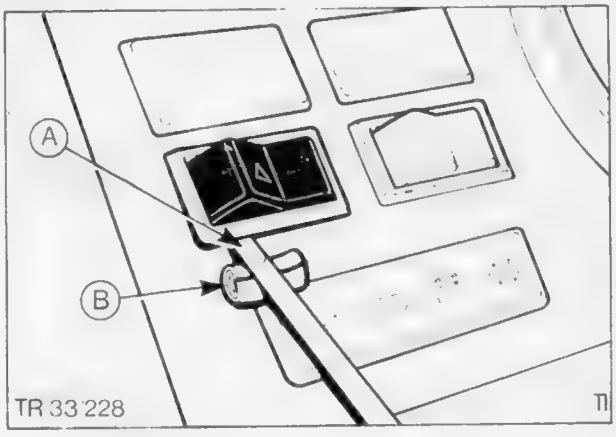


Fig. 54. Removing switch
A – Screwdriver
B – Protecting wadding

PART 'B'

33 224 4 PRINTED CIRCUIT – INSTRUMENT CLUSTER – REMOVE AND INSTALL (Instrument cluster removed)

Warning Lights and Clock

Special Service Tools Required: None

To Remove

1. Remove two clock illumination bulbs and holders, Fig. 55. Also remove five warning lamps.

2. Slacken off, but do not remove four screws securing fuel/temperature gauge housing and four screws securing speedometer housing to instrument cluster body.

3. Unscrew three clock retaining nuts and washers, Fig. 56.

4. Unpeg printed circuit from its four locating pegs, Fig. 57, carefully untucking circuit from under edges of speedometer housing and fuel/temperature gauge housing. Remove printed circuit.

To Install

5. Locate printed circuit onto its four locating pegs, Fig. 57, carefully tucking circuit underneath speedometer housing and fuel/temperature gauge housing where printed circuit overlaps housings.

6. Secure clock with three nuts and washers.

7. Refit five warning lamps and two clock illumination lamps.

8. Secure speedometer housing and fuel/temperature gauge housing by tightening eight screws.

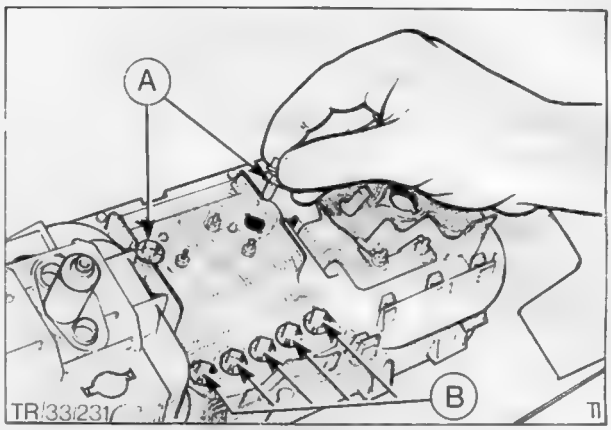


Fig. 55. Removing bulbs
A – Illuminating bulbs
B – Warning lights

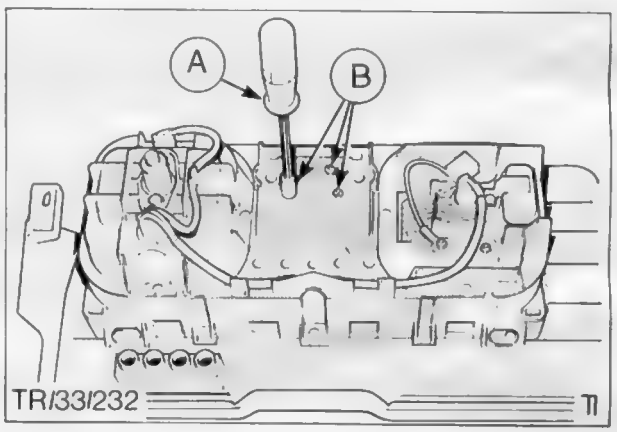


Fig. 56. Removing clock retaining nuts
A – Socket spanner
B – Securing nuts

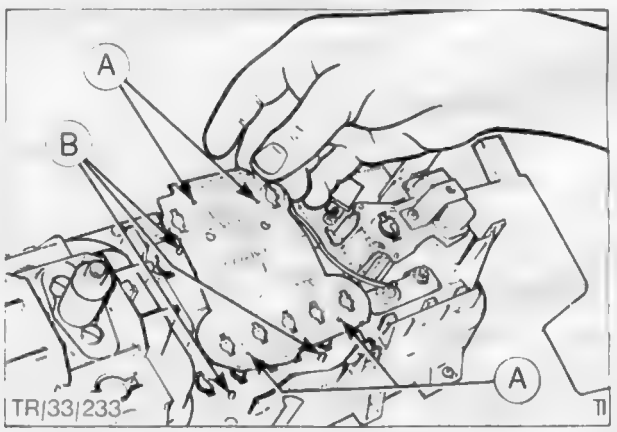


Fig. 57. Locating printed circuit
A – Locating holes
B – Locating pegs (three of the four pegs shown, fourth peg obscured)

PART 'B'

33 226 4 GLASS – INSTRUMENT CLUSTER – REPLACE

Special Service Tools Required: None

To Remove

1. Remove instrument cluster housing assembly as described in Operation No. 33–214, Sub-Operations 1 to 8.

2. Remove instrument cluster assembly from bezel surround by removing six screws.

3. On variants fitted with a clock mounted in instrument cluster unscrew the clock adjuster knob and remove, Fig. 58.

4. Remove two cross-head screws, securing glass to upper edge of instrument cluster, Fig. 59.

5. Prise two clips off lower edge lugs and lift glass from cluster body.

To Install

6. Replace glass positioning it on cluster housing so two locating pegs on upper corners of cluster body insert through glass. Fig. 60. Locate lugs on lower edge of glass so that they engage cut-outs in housing body.

7. Secure glass to housing body with two cross-head screws along upper edge, Fig. 59, and press on two clips on lower edge.

   If a clock is fitted in instrument cluster locate clock adjustment knob and secure with screws.

8. Replace instrument cluster assembly to bezel and secure with six screws.

9. Refit instrument cluster and panel to vehicle, as described in Operation No. 33–214, Sub Operation 9 to 17.

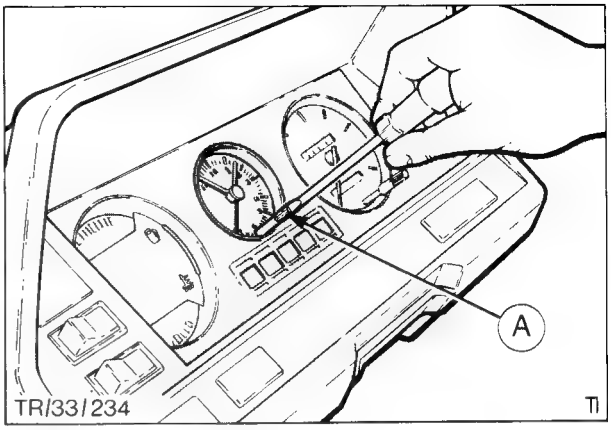


Fig. 58. Removing clock knob (where fitted)
A – Knob

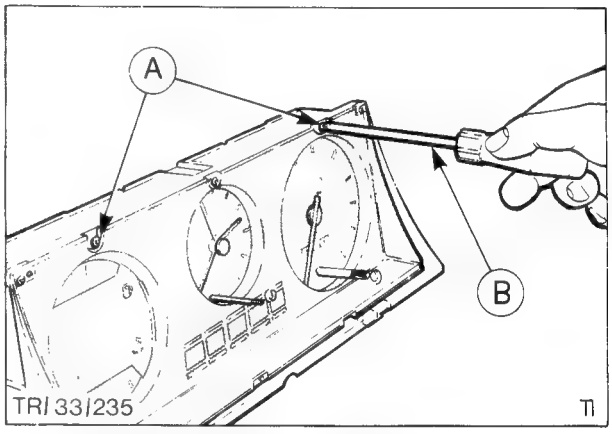


Fig. 59. Removing glass securing screws
A – Screws
B – Screwdriver

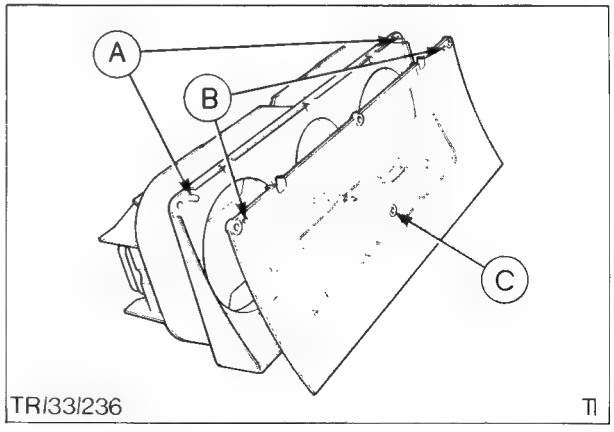


Fig. 60. Aligning glass
A Locating pegs
B – Locating holes
C Hole for clock shaft (where fitted)

PART 'B'

33 254 HEAD – SPEEDOMETER – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove instrument cluster and panel assembly as described in Operation No. 33–214, Sub Operations 1 to 8.

2. Remove four cross-head screws securing speedometer head and housing to instrument cluster body.

3. Disconnect two speedometer illumination bulbs and holders. Unclip wiring loom from speedometer housing, Fig. 51.

4. Unscrew two slot headed screws retaining speedometer unit to housing, Fig. 62, Remove speedometer unit, gasket and two grommets

To Install

5. Position gasket and speedometer head to housing and secure in position with two slot headed screws and grommets, Fig. 62.

6. Align speedometer and housing to instrument cluster body, Fig. 63, and secure using four cross-head screws.

7. Reconnect speedometer illumination bulbs and holders, clip wiring loom back into position.

8. Refit instrument cluster and panel assembly as described in Operation No. 33–214, Sub Operations 9 to 17.

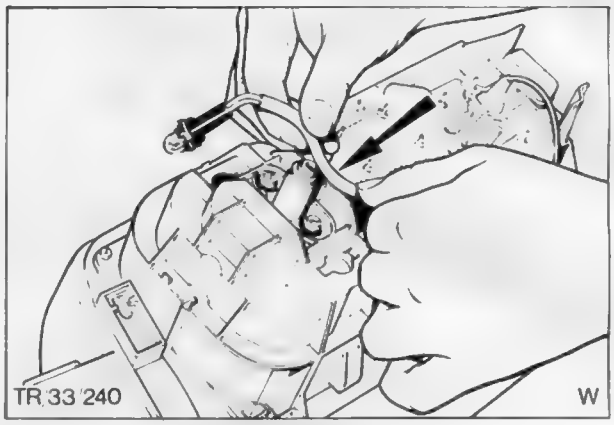


Fig. 61. Unclipping loom from housing. Clip position arrowed

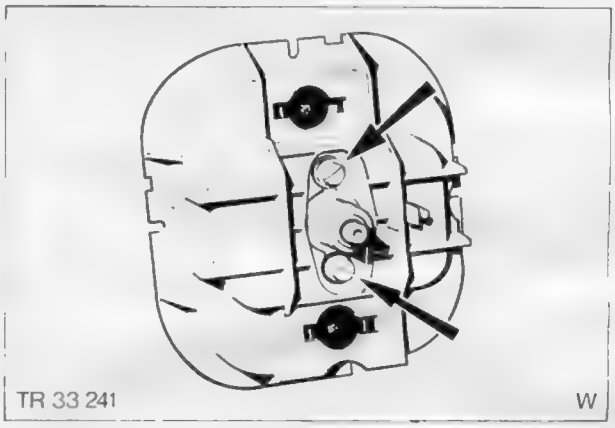


Fig. 62. Speedo unit to housing screws (arrowed)

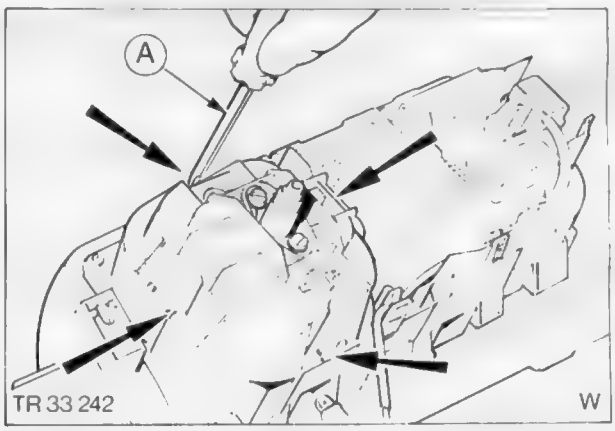


Fig. 63. Securing speedo housing
A – Screwdriver
Screw locations arrowed

PART 'B'

33 256 CABLE – SPEEDOMETER INNER AND OUTER – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove instrument cluster and panel assembly as described in Operation No. 33-214, Sub Operations 1 to 8.

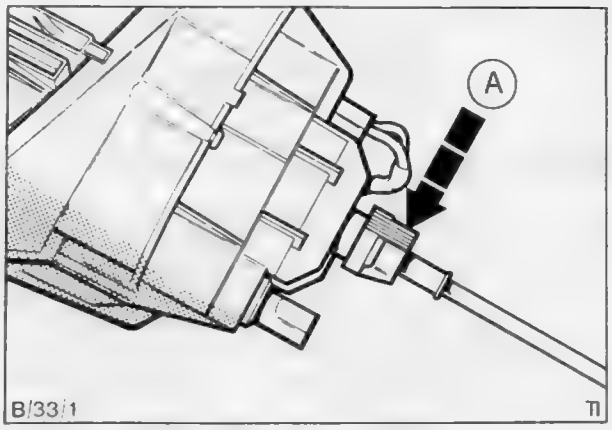


Fig. 64. Disconnect speedo by depressing grooved section in direction of arrow 'A'

2. Jack up front of vehicle and fit axle stands.

   Remove bolt and spring washer securing cable retaining clamp to gearbox, remove clamp and speedometer drive cable from gearbox, Fig. 65.

   Pull cable through bulkhead panel and remove from engine compartment.

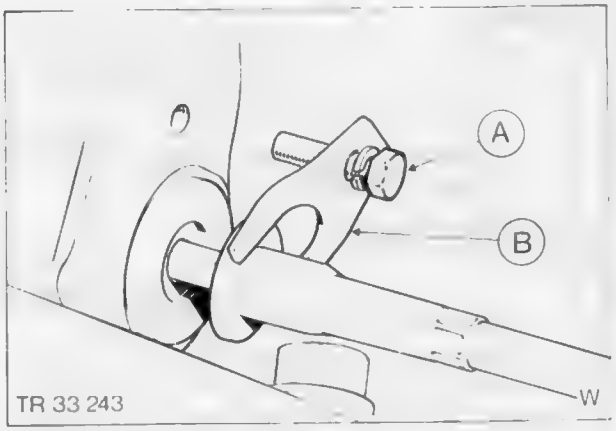


Fig. 65. Disconnecting speedo cable
A - Securing bolt
B - Clamp

To Install

Insert cable through bulkhead aperture and fit grommet into its dash panel location. Feed cable through dash panel aperture until colour band on cable coincides with grommet.

Route cable to extension housing and locate cable in gearbox housing driven gear. Assemble spring washer and clamp to bolt, locate fork of clamp over speedometer cable casing and secure. Tighten bolt to 6,9 to 9,8 Nm (0,7 to 1,0 kgm) (5 to 7 lbf.ft)

Remove axle stands and lower vehicle to ground.

Refit instrument cluster and panel assembly as described in Operation No. 33–214, Sub Operations 9 to 17.

PART 'B'

33 284 GAUGE – FUEL – REMOVE AND INSTALL (Variants fitted with standard facia)

Special Service Tools Required: None

NOTE: Removal and installation procedure for Operation No. 33–284 – Gauge – Fuel – Remove and Install and 33–304 – Gauge – Temperature – Remove and Install, are the same, differing only in which gauge is actually removed. For this reason Operation No. 33–304 has been incorporated into this operation (33–284).

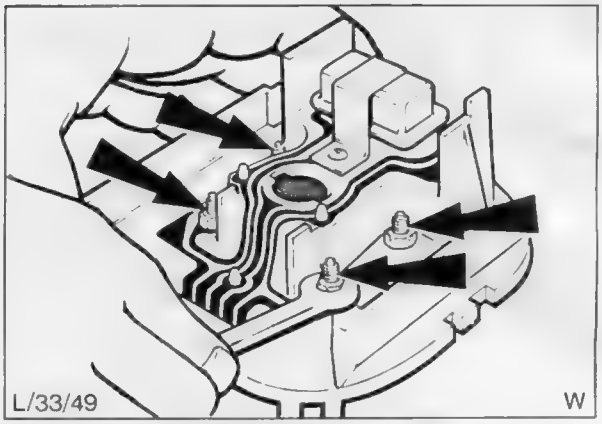


Fig. 66. Location of fuel and temperature gauge securing nuts

To Remove

1. Remove instrument cluster and panel assembly as described in Operation No. 33–214, Sub Operations 1 to 8.
2. Disconnect four screws securing instrument housing to cluster body, Fig. 66.
3. Unplug illumination bulb and holder and remove instrument housing.
4. Remove two nuts and washers from gauge retaining studs, detach gauge, Fig. 67.

   NOTE: If temperature gauge is being removed a plastic insulator also has to be detached from the lower stud.

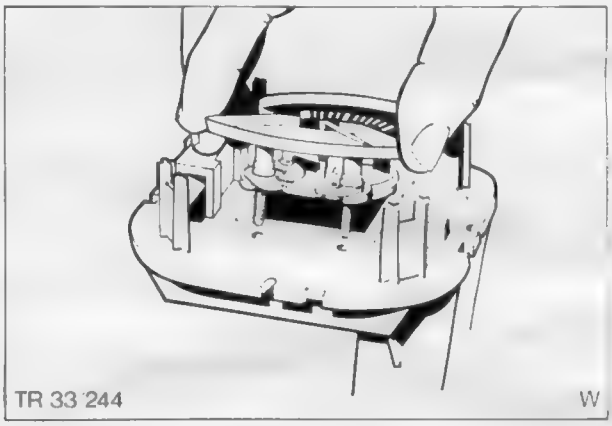


Fig. 67 Removing gauge from housing. Take care not to mark gauge face

To Install

5. Position gauge in its housing and secure with two washers and nuts, Fig. 68.

   NOTE: Lower stud on temperature gauge also has a plastic insulation washer which must be fitted first.
6. Locate instrument housing onto cluster housing assembly and secure with four screws.
7. Plug in illumination bulb and holder.
8. Replace instrument cluster and panel assembly into vehicle as described in Operation No. 33–214, Sub Operations 9 to 17.

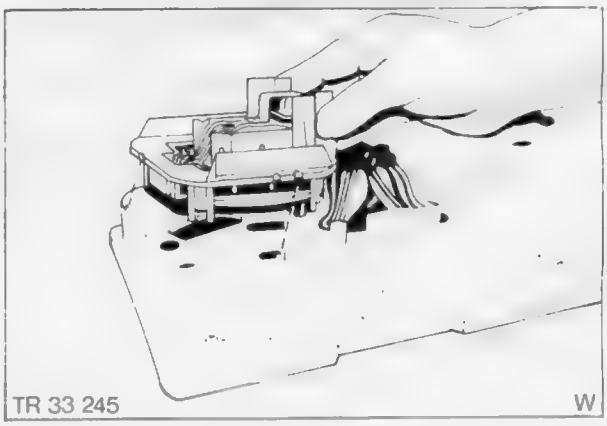


Fig. 68. Aligning instrument housing to main cluster body

PART 'B'

33 306 SENDER UNIT – TEMPERATURE – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.

2. Remove radiator cap.

   NOTE: When removing cap rotate through approximately 90° to allow system to depressurise before fully removing cap.

3. Place a clean drain tray below vehicle, disconnect bottom hose at the radiator and allow to drain.

4. Disconnect wire at sender unit. and unscrew sender unit from cylinder head.

To Install

5. Screw sender unit into cylinder head. Connect wire.

6. Connect bottom hose to radiator. Refill cooling system with specified anti-freeze, or rust inhibitor, and water solution. Refit radiator cap.

7. Reconnect battery, run engine, check and top up coolant level as required.

8. Remove fender covers, and close hood.

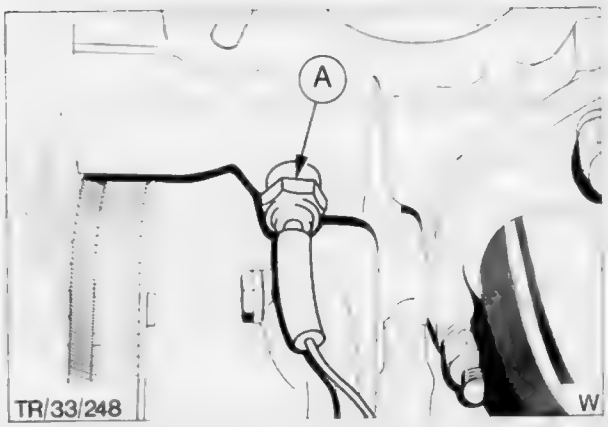


Fig. 69. Sender unit on OHV variants
A Sender unit

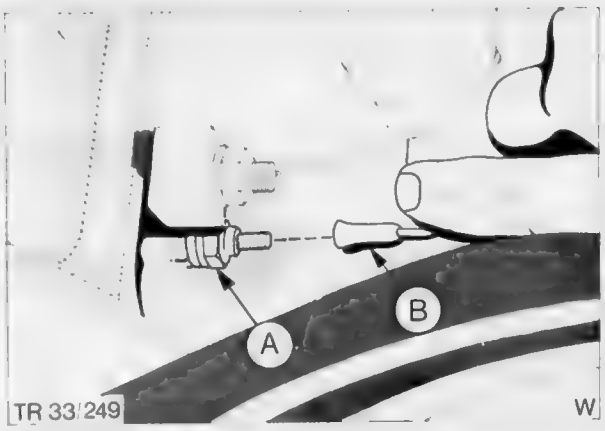


Fig. 70. Sender unit on OHC variants
A - Sender unit
B Loom connector

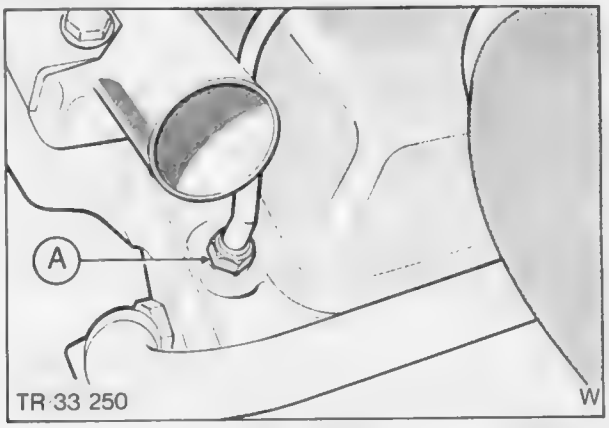


Fig. 71. Sender unit on diesel variants
A Sender unit
NOTE Top hose removed for clarity

PART 'B'

33 374 CLOCK – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Remove instrument cluster and panel assembly as described in Operation No. 33–214, Sub Operations 1 to 8.

2. Remove three illumination bulbs and sockets and their associated wiring.

3. Unscrew clock adjuster knob securing screw and remove knob, Fig. 72.

4. Unscrew four cross-head screws securing speedometer housing and lift speedometer clear. Likewise remove four housing cross-head screws from fuel/temperature gauges and lift instruments and housing clear of cluster.

5. Remove four clock and warning light plate retaining screws and lift assembly clear.

6. Remove three nuts and washers from clock retaining stubs, Fig. 73. Remove clock from plate.

To Install

7. Align clock in plate and secure with three nuts and washers

8. Refit clock and warning light assembly into position and secure with four cross-head screws.

9. Refit speedometer housing and secure with four cross-head screws. Likewise locate fuel/temperature gauge housing on its location pegs and secure with four cross-head screws.

10. Locate clock adjustering knob and secure with screws.

11. Replace the three instrument illumination bulbs, holders and associated wiring. Twist bulb holders to secure.

12. Replace instrument cluster and panel assembly in vehicle as described in Operation No. 33–214, Sub Operations 9 to 17.

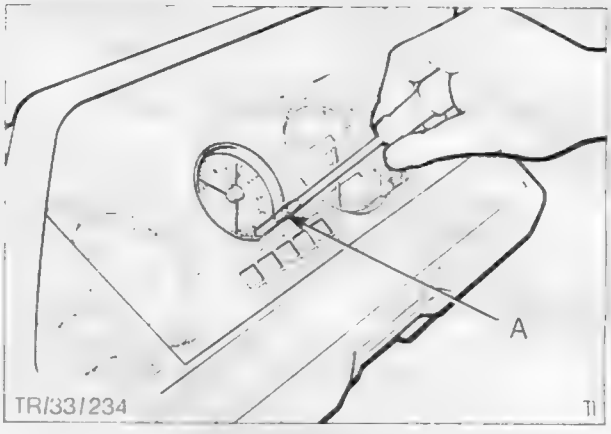


Fig. 72 Removing clock knob
A Knob

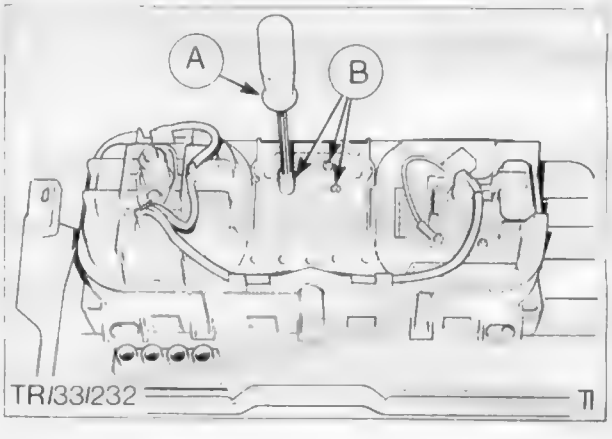


Fig. 73 Removing clock retaining nuts
A Socket spanner
B Securing nuts

Fig. 74 Clock removed from cluster

PART 'B'

33 384 CIGARETTE LIGHTER – REPLACE

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Remove facia trim panel by releasing six screw clips.

   NOTE: If vehicle is fitted with a radio first remove radio knobs and radio surround bezel.
3. Remove cigarette lighter assembly by pulling out element, disconnecting feed wire, earthwire and illumination bulb. Push collar against spring tension and twist in an anti-clockwise direction.

To Install

4. Refit assembly in order shown in Fig. 75.
5. Reconnect insulated feed wire, earth wire and illumination bulb. Refit element.
6. Align facia panel and secure by rotating clips through 90°.

   NOTE: If vehicle is fitted with a radio, position radio surround bezel and refit radio knobs.
7. Reconnect battery, remove fender covers and close hood.

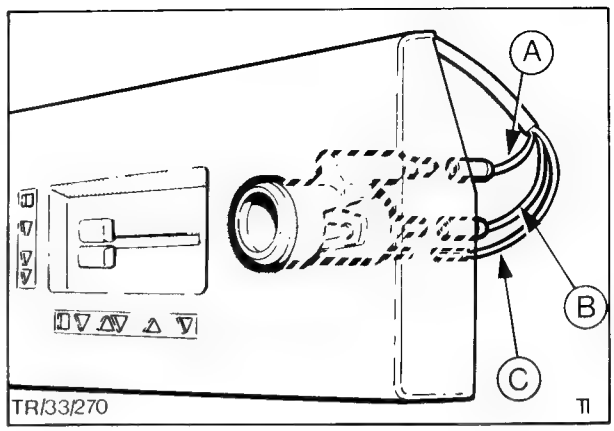


Fig. 75. Cigarette lighter wiring
A – Illumination bulb feed wire
B – Main feed wire (red)
C – Earth wire (brown)

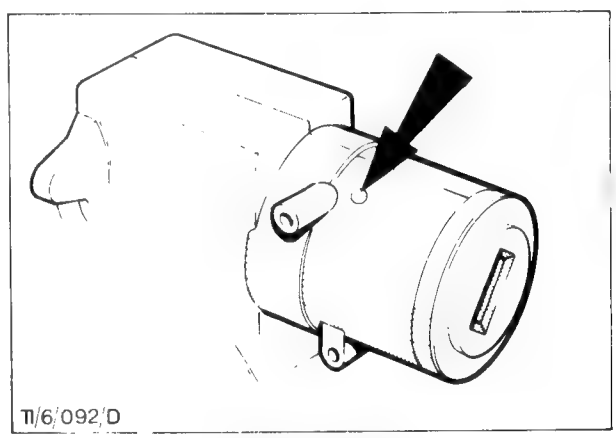


Fig. 76. Key cylinder leaf spring access hole

33 513 LOCK BARREL – IGNITION SWITCH – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender cover, and disconnect battery.
2. Remove upper and lower steering column shrouds by removing five cross-head screws.
3. Insert key into ignition switch and turn to position '1' (accessory). This has the effect of aligning key barrel retaining circlip and keyway register in the housing.
4. Using a suitable tool, such as a scriber, depress key cylinder leaf spring through access hole, Fig. 76, provided in lock housing, whilst pulling on key until key cylinder and lock barrel are withdrawn.

   NOTE: Slight clockwise and anti-clockwise movements of the key may be necessary in order to align key barrel and lock housing drive cam, hence allowing removal of cylinder and barrel.

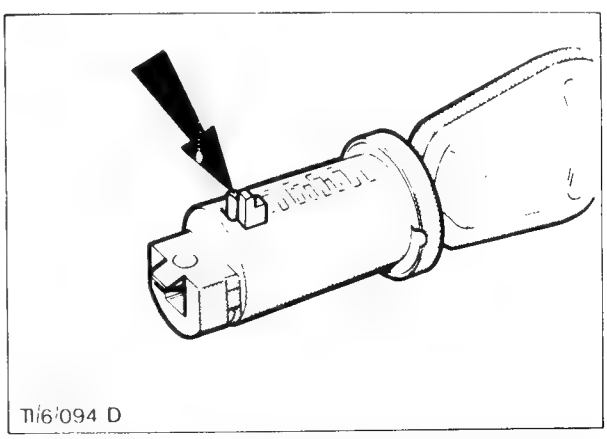


Fig. 77. Key barrel with key fully inserted showing securing ward

PART 'B'

5. Insert key fully into key barrel and remove retaining circlip. Ensure circlip location on lock barrel is undamaged otherwise location of circlip may be affected on reassembly.

6. Withdraw key approximately 5 mm (0,2 in). This causes an additional securing ward, Fig. 74, which acts on key cylinder chamfer, to be brought flush to barrel.

7. Key barrel may now be removed from cylinder.

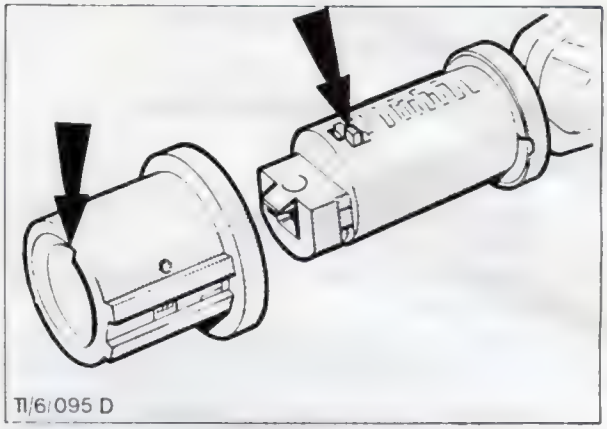


Fig. 78. Assembly of barrel into key cylinder

To Install

8. Insert key fully into barrel, and withdraw key approximately 5 mm (0,2 in) to bring additional ward, Fig. 77, flush with barrel.

9. With reference to Fig. 78, insert barrel into cylinder. Barrel can only be fitted in one position, and this allows securing ward to operate on key cylinder chamfer.

10. With key fully inserted, check that key and barrel may be turned from position 'O' to position 'III'.

11. Turn key to accessory ('I') position, and fit retaining circlip. The open 'jaws' of circlip must align with keyway register on cylinder, see Fig. 79.

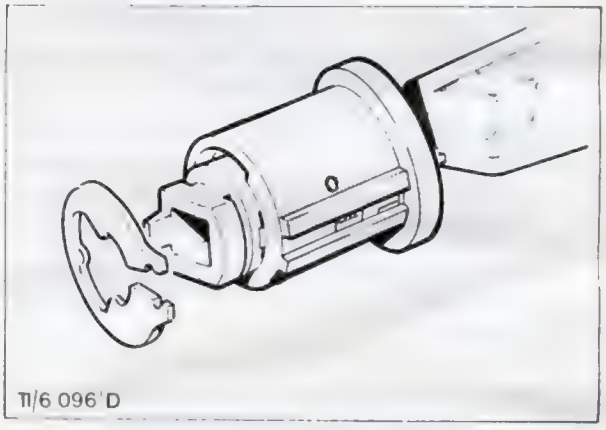


Fig. 79. Fitting retaining circlip

12. With reference to Fig. 80 insert cylinder assembly into housing. Ensure cylinder is pushed fully into housing, and leaf spring locates into undercut slot in housing.

13. As in removal operation, slight clockwise and anti-clockwise, movements of the key may be necessary to achieve correct alignment of key barrel and lock housing drive cam.

14. Check operation of lock assembly in all positions and if satisfactory, return the key to position 'O' and remove the key.

15. Refit the steering column upper and lower shrouds, secure with five cross-head screws.

16. Reconnect battery, remove fender cover, and close hood.

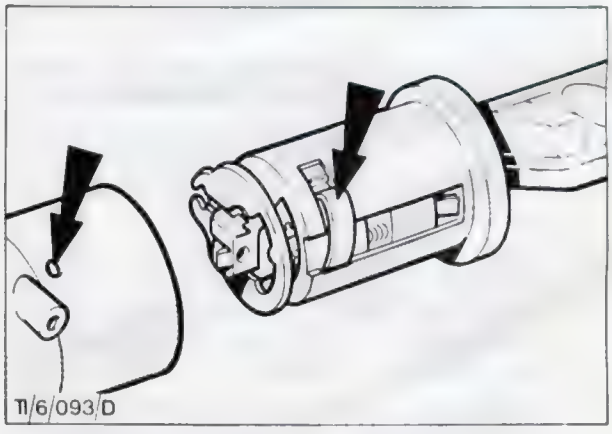


Fig. 80. Housing and cylinder in correct alignment prior to assembly

PART 'B'

33 524 SWITCH – COURTESY LIGHT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender cover and disconnect battery.
2. Remove securing screw and pull out switch, Fig. 81, pull loom out from door pillar and disconnect loom. Before disconnecting ensure loom is pulled well clear of pillar.

To Install

3. Reconnect loom, feed loom back into door pillar and fit switch in position, secure with cross-head screw.
4. Reconnect battery and check switch for correct function. Remove fender cover and close hood.

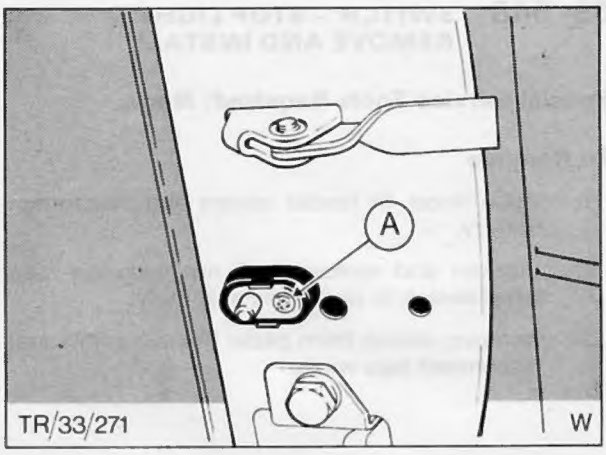


Fig. 81. Courtesy light switch
A – Securing screw

33 528 SWITCH – BACK UP LAMP – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood and fit fender covers.
2. Jack up front end of vehicle and fit axle stands.
3. Disconnect loom and unscrew switch which is located in gearbox extension housing, Fig. 82.

To Install

4. Refit switch and reconnect loom. Ensure loom is well clear of exhaust and does not foul transmission.
5. Check operation of switch.
6. Remove stands and lower vehicle to ground.
7. Remove fender covers and close hood.

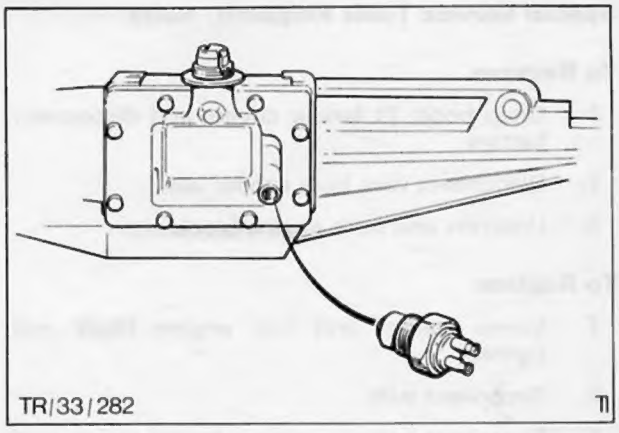


Fig. 82. Location of switch

PART 'B'

33 548 SWITCH – STOP LIGHT – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Slacken and remove lock nut securing stop lamp switch to pedal box assembly.
3. Remove switch from pedal box assembly and disconnect two wires.

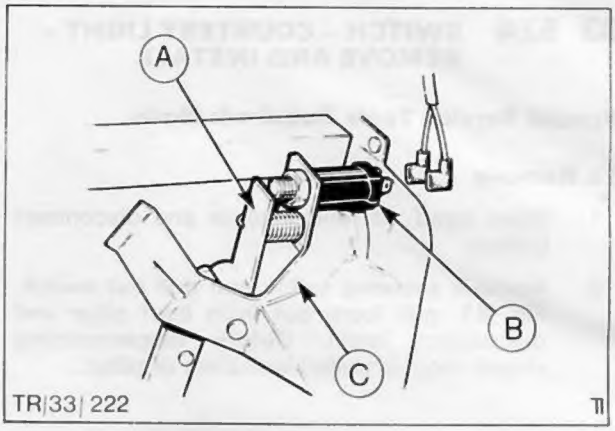


Fig. 83. Stop light switch
A – Brake pedal
B – Stop light switch
C – Pedal box

To Install

4. Connect switch to two wires.
5. Align switch in pedal box and retain with lock nut.
6. Adjust switch so it operates within first inch of pedal travel. Tighten lock nut.
7. Reconnect battery, remove fender covers and close hood.

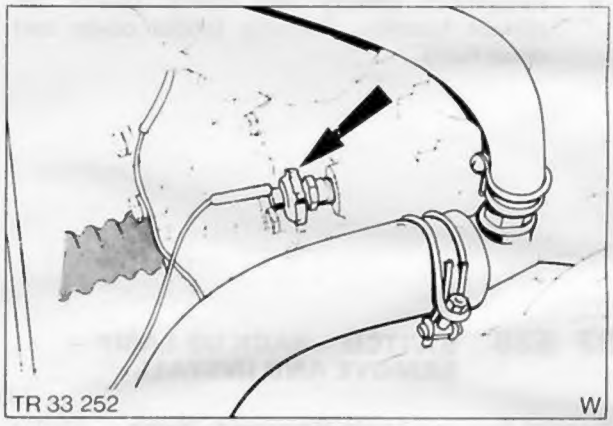


Fig. 84. Oil pressure switch, OHV variants
A – Switch

33 554 SWITCH – OIL PRESSURE WARNING LIGHT – REPLACE

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Disconnect wire from sender unit.
3. Unscrew unit from engine block.

To Replace

4. Screw sender unit into engine block and tighten.
5. Reconnect wire.
6. Reconnect battery, remove fender covers and close hood.

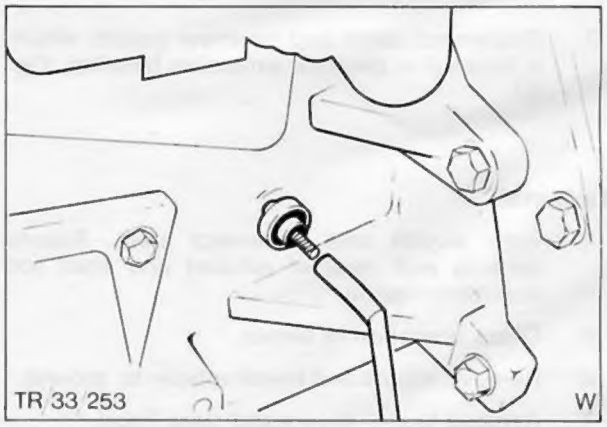


Fig. 85. Oil pressure switch, OHC variants

PART 'B'

33 557 SWITCH – REAR FOG LAMP – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Using a soft cloth or a wad of paper, cover facia panel area immediately below switch location.
3. Using a small electrical screwdriver, pivoting on protective material, prise switch from its bezel location, Fig. 86.
4. Detach multi-plug and remove switch.

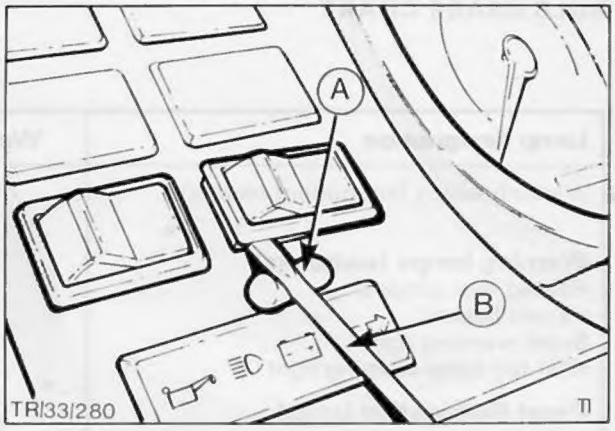


Fig. 86. Lever switch from panel
A – Protective wad
B – Screwdriver

To Install

5. Connect loom multi-plug to rear of switch, Fig. 88.
6. Position switch in facia and push home to secure.
7. Reconnect battery, remove fender covers, and close hood.

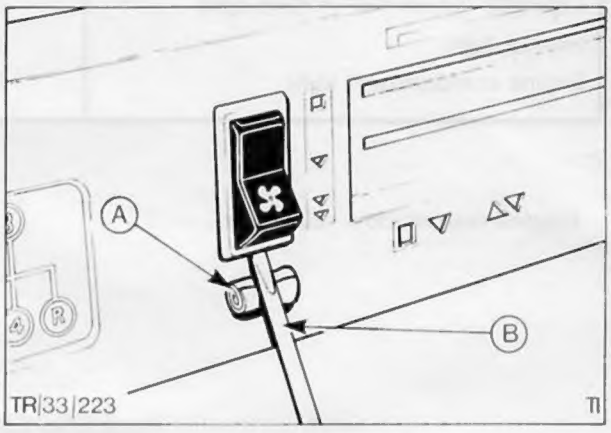


Fig. 87. Lever switch from panel
A – Protective wad
B – Screwdriver

33 574 SWITCH – HEATER MOTOR – REMOVE AND INSTALL

Special Service Tools Required: None

To Remove

1. Open hood, fit fender covers and disconnect battery.
2. Using a soft cloth or a wad of paper, cover heater control panel area immediately below switch location.
3. Using a small electrical screwdriver, pivoting on protective material, prise switch from its bezel location, Fig. 87.
4. Detach multi-plug and remove switch.

To Install

5. Connect loom multi-plug to rear of switch.
6. Position switch in facia and push home to secure.
7. Reconnect battery, remove fender covers, and close hood.

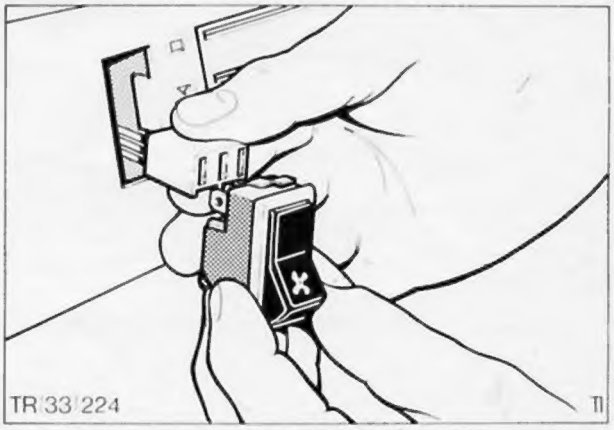


Fig. 88. Align switch to multi-plug and connect

TECHNICAL DATA

BULB USAGE CHART

Lamp designation	Wattage	Fitting	Remarks
Warning lamps (instrument cluster)	1,3	Glass socket	Standard facia
		Glass socket	Tachograph variants
Warning lamps (switches)			
Heated rear window	1,3	Glass socket	Where fitted
Hazard flasher	1,3	Glass socket	
Brake warning light	1,3	Glass socket	Where fitted
Rear fog lamp warning light	1,3	Glass socket	Where fitted
Panel illumination lamps	2,6	Glass socket	Standard facia
	2,0	Bayonet	Tachograph variants
Clock illumination light	2,6	Glass socket	Where fitted
Heater control illumination light	2,0	Glass socket	
Automatic trans. selector quadrant light	1,4	Bayonet	Where fitted
Cigarette lighter illumination light	1,4	Bayonet	Where fitted
Interior light	5,0	Bayonet/festoon	
Engine compartment light	5,0	Bayonet	Where fitted

Heated rear window relay fuse	16 amps